RECOVERING ERGATIVITY IN HERITAGE SAMOAN

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By

Grant Muāgututiʻa

Dissertation Committee:

Kamil Ud Deen, Chairperson
William O'Grady
Bradley McDonnell
John Mayer
Yuko Ostuka

Mo Sāmoa

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Abstract

The unique language profile of a heritage speaker offers an ideal opportunity to investigate the persistence of specific linguistic systems in the face of language shift (i.e. reduced input). Ergativity, the morphosyntactic system of alignment that sets A (the subject of a transitive verb) apart from O (the object of a transitive verb) and S (the sole argument of an intransitive verb), has been shown to be a fragile linguistic feature particularly sensitive to changes in language input, as it is often late acquired by children (Ochs 1982, Bavin & Stoll 2013), and lacking in heritage grammar (Schmidt 1985; Montrul et al. 2012).

This dissertation investigates whether ergativity persists in the grammar of Samoan heritage speakers in spite of the abrupt shift in language input during early childhood (i.e. from Samoan to English, an accusative language). Samoan, a relatively understudied language, exhibits a robust system of ergativity at both the morphological (i.e. case, agreement) and syntactic level (i.e. relative clauses, *wh*-questions, quantifier float) (Mosel & Hovdhaugen 1992). Four experiments were carried out investigating the production and grammaticality judgement of key ergative features in declaratives, *wh*-questions, and relative clauses in three distinct speaker groups: native, heritage, and L2. The findings from this dissertation suggest that ergativity in Samoan is indeed a fragile system particularly susceptible to decreased language input. However, in spite of an initial lack of ergativity in heritage grammar, key ergative features were recovered through targeted linguistic intervention (i.e. explicit modeling, recasting). The results demonstrate that heritage speakers were able to recover an underlying pattern of ergativity (i.e. extending ergative features to structures not included in the intervention), while L2 speakers were only able to acquire construction-specific features. These findings lend support for the Permanence Hypothesis (Brenner 2010, cited in Benmamoun, Montrul, Polinsky 2013), that is, linguistic knowledge acquired during critical periods of language acquisition persists throughout life.

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1	1st person	PRD	predicate
2	2nd person	PRF	perfective
3	3rd person	PROG	progressive
ABS	absolutive	PRN	pronoun
ASP	aspect	PRS	present
DIR	directional	PRT	particle
ERG	ergative	PST	past
GEN	genitive	RC	relative clause
INTR	intransitive	SG	singular
NEG	negative	TR	transitive
PL	plural	WHQ	wh-question

Chapter 1. Introduction

This chapter provides the essential background from which the subsequent study is conducted. The chapter begins with a discussion of heritage speakers, as a unique opportunity for language acquisition research, followed by a discussion of the fragility of ergative systems cross-linguistically. An outline of Samoan is then given, pointing to Samoan heritage speakers as an ideal speaker group in terms of understanding the effects of language shift on the mechanics of the language learning (i.e. decrease in language input). The research questions addressed in this dissertation are then laid out, detailing the specific objectives of the experiments to follow. Finally, an outline of the study as a whole is provided in the conclusion.

1.1 The Heritage Speaker

Most often when thinking of a prototypical language learner, the native speaker is the first to come to mind. Native speakers are those that have been exposed to their language from childhood without any significant interruptions during critical learning periods. They have successfully acquired the intricate grammatical system of the language (i.e. phonology, morphology, syntax, pragmatics, etc.) that they share with other native speakers of their language. This allows them to transmit ideas with ease, interpret language input, as well as pass on their linguistic knowledge intergenerationally to fellow members of their community. In addition, they are able to recognize other native speakers of their language due to the unique features shared within their common grammar (i.e. pronounciation, vocabulary, idioms, etc.). Native speakers, then, have complete command over the morphosyntactic system of the language due namely to the ample, uninterrupted input they received during their language development. However, the native speaker is not representative of all language learners.

In fact, at the other end of the spectrum is the second language (L2) speaker. L2 speakers are those who have experienced all learning of a particular language after critical learning periods during childhood. L2 speakers are quite distinguishable from native speakers in their use of certain grammatical features, as well as pronunciation. Often an L2 speaker can become considerably proficient in the language, but will never achieve the same mastery in that language as a native speaker. However, somewhere between the profile of native speaker and an L2 speaker, there is a third type of language learner, that is, the heritage speaker.

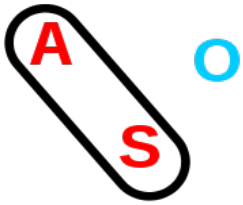
Heritage speakers are usually considered to be those who, from birth, are raised in a bilingual or multilingual environment. Acquisition of their L1, often a minority language, subsequently shifts to another language (i.e. the majority language) at around the ages of 4 – 6 years due to a change in language input and exposure, usually as a result of formal schooling. This often results in speakers who are more proficient in the majority language than their heritage language, often having adept control over certain linguistic features of the language, while lacking full command of others. This heritage speaker profile overlaps with both native and L2 speakers, in that they received early exposure to the language (similar to native speakers), but due to change in language input and attrition, lack key grammatical features, often making them indistinguishable from L2 speakers (Benmamoun et al. 2013).

Heritage speakers, then, offer a unique opportunity to investigate the persistence of particular aspects of specific grammatical systems in the face of reduced language input, in this case, ergativity, a particularly fragile morphosyntactic feature.

1.2 The Fragility of Ergativity

As defined by Dixon (1979), ergativity refers to the linguistic pattern of morphosyntactic alignment in which a language treats the sole argument of an intransitive verb (S) in the same way as it does the object of a transitive verb (O, both absolutive), while the agent of a transitive verb (A) is treated differently (ergative). This contrasts with the more familiar pattern we see in English, accusativity, where S and A are treated the same (both nominative), while O is treated differently (accusative). This is depicted in Figure 1 below.

Figure 1.1. Ergativity vs. Accusativity

Ergativity	**Accusativity**
	

Ergativity can occur at both the morphological and syntactic level. Morphological ergativity is present when case or agreement differentiates A from O and S, while syntactic ergativity manifests itself when a syntactic process differentiates A from O and S. Syntactic ergativity is often seen in relativization, wh-questions, and topicalization, where the syntactic process differentially picks out absolutive arguments to the exclusion of the ergative argument.

Although ergativity is a wide spread phenomenon amongst the world's languages, it remains an unfortunately understudied one, especially in the fields of language acquisition and heritage language research. Cross-linguistically, ergativity has been argued to be fragile, or recessive (e.g. Nicols, 1993; Bickel, 2008; See Longenbaugh & Polinsky, 2017 for review), in that it is vulnerable to loss across generations and in contact situations. The population in which the fragility of ergativity may be assessed, therefore, is that of the language acquirer. Heritage speakers of Samoan, an understudied language with a robust system of ergative features, offer a unique opportunity to assess the effects of changes in language input during the course of language acquisition.

1.3 Samoan and Ergativity

Samoan belongs to the Polynesian subgroup of the Austronesian language family, and is the official language of the two culturally homogeneous, yet politically distinct, archipelagic states of Sāmoa and American Sāmoa, both of which are comprised of a majority of Samoan native speakers. There are also sizable immigrant communities in New Zealand, Australia, Hawai‘i, and the continental United States, where Samoan is still spoken. The most reliable counts estimate there to be over 400,00 speakers of Samoan worldwide (Bell et al. 2002, Ethnologue). However, recent trends have shown a consistent shift away from the use of the Samoan language in both diasporic communities (Lesā 2009, Wilson 2010, Alofaituli 2011), and more alarmingly, American Sāmoa (Freese & Haleck 2000, Hunkin-Finau 2010). This current state of affairs offers an opportunity to assess the early effects of language shift (to English, an accusative language) on ergative features in the Samoan language, as well as the extent to which lacking features might be recoverable (in an effort to reverse the language shift). This dissertation directly addresses these issues by presenting empirical research investigating the stability and recoverability of the underlying system of morphosyntactic alignment in Samoan, ergativity, in heritage speakers, providing crucial comparisons with native and L2 speakers of Samoan.

While the current study is the first to investigate ergativity in heritage Samoan, evidence from the L1 acquisition of Samoan suggests that ergativity is a fragile feature of the language, in that it is acquired quite late by children (consistent with studies of the acquisition of ergativity cross-linguistically – see Austin 2013, Bavin 2013, Allen 2013, Stoll & Bickel 2013). Ochs (1982) found that the ergative case marker rarely appeared (> 5%) in the naturalistic speech of monolingual Samoan children (2 - 4 yrs). In addition, Muāgututi'a, Deen, & O'Grady (2016) found that consistent use of both morphological (i.e. case) and syntactic ergativity (i.e. relativization) do not occur until after the age of 7. By at least the age of 8, however, children exhibit close to adult-like control of ergativity. This is an unusually late age for the mastery of a signature feature of the language, suggesting that ergativity in Samoan may in fact be a fragile feature particularly susceptible to obsolescence in the case of decreased language input. This fragility would be further enhanced by considerable pressure from a non-ergative majority language (i.e. English) in a heritage language situation. It may be that ergativity constitutes the leading edge in the loss of a language amongst heritage speakers.

This is an ideal opportunity to understand the effects of decreased language input on fragile linguistic systems like Samoan ergativity to not only be able to provide a more fine-grained, morphosyntactic assessment of the effect of language shift, but also to identify possible countermeasures that might aid in reversing the trend. For this reason, the current study provides an in-depth investigation into the recovery of ergativity in heritage Samoan. The key research questions addressed in this study are presented in detail in the following section.

1.4 Research Questions

This section lays out a series of interdependent research questions that seek to address the stability of ergativity in Samoan, looking specifically at both the persistence and resillience of ergative features in the grammar of heritage speakers, offering unique insight into the enduring effects of language input during critical learning periods of language development.

1. Given the fragility of ergativity, how stable are ergative features across different speaker types (i.e. native, heritage, L2)? Do ergative features persist in spite of reduced language input? If ergativity is not a fragile feature, there should be a noticeable presence of ergativity across all three speaker types. However, if ergativity is indeed fragile, ergative features should be considerably vulnerable to changes in language input, that is, native speakers

should exhibit a robust system of ergativity (given the ample input they have received), while heritage (and L2) speakers should lack key ergative features (given the limited or sparse input).

2. If this is indeed the case, can particular ergative features initially found lacking in heritage grammar be recovered through careful linguistic intervention? An absence of ergativity in heritage Samoan would create a crucial gap in fundamental grammatical constructions. Would this gap in syntactic knowledge be permanent, or could it be filled through a targeted intervention where heritage speakers are trained in the use of key ergative features?

3. If key ergative features are indeed recoverable through targeted intervention, how durable would these recovered features be? Would the intervention have a superficial effect, or would any improvement in ergativity represent a more durable, long-lasting change, perhaps indicative of a more permanent change in grammar?

4. If the recovery does demonstrate a durable change in grammar, to what extent has the grammar been affected? Are the recovered ergative features specific to individual constructions, or have they been generalized as an underlying pattern of ergativity across a range of both morphological and syntactic structures, suggesting a change in underlying grammar?

5. If an underlying pattern of ergativity has indeed been recovered, can any differences be observed between the effects of intervention targeting morphological versus syntactic features? That is, which type of ergative cues might generate a more robust recovery, syntactic or morphological?

6. And finally, what would the source of this recovery be? Are recovered features part of implicit knowledge already present in the heritage grammar that have been dormant since childhood, and only now reactivated? Or is it merely the result of fresh knowledge acquired as an adult (i.e. L2 acquisition), and the extensive increase of ergative features is a testament to the effectiveness of the intervention, rather than latent grammatical knowledge?

Each of these questions are directly addressed by a series of experiments presented in the chapters to follow. The next section outlines each of the experiments and their contribution to the study as a whole.

1.5 Study Overview

The study begins in Chapter 2 where an overview of ergativity as it is manifested in Samoan is provided, detailed descriptions of both morphological and syntactic ergative structures in Samoan are presented.

Chapter 3 then opens the experimental portion of the study with Experiment 1: Ergativity in Native Samoan, an investigation of adult native speakers of Samoan, measuring the production and grammaticality judgement of a range of ergative structures (i.e. declaratives, *wh*-questions, relative clauses, resumptive pronouns).

These results are then compared in Chapter 4 with the results from Experiment 2: Ergativity in Heritage Samoan, an investigation of key ergative features in the grammar of heritage speakers. This experiment reveals a crucial gap in ergativity in Samoan heritage grammar.

Chapter 5 then presents Experiment 3: An Ergative Intervention, where this crucial gap in ergativity is addressed through a targeted linguistic intervention to recover key ergative features, both morphological and syntactic, demonstrating that a durable recovery is indeed achievable.

Chapter 6 concludes the experimental portion of the study by presenting a final experiment carried out in the investigation of the source of recovered ergativity in heritage Samoan, by investigating the stability of ergativity in the grammar of L2 speakers of Samoan.

The study concludes with a summary of key results, as well as a detailed discussion of the implications of these findings not only for the field of language development but also language maintenance.

Chapter 2. Samoan Ergativity

This chapter provides an overview of ergativity as it is manifested in Samoan. The chapter begins by defining ergativity as a pattern of morphosyntactic alignment, followed by detailed descriptions of both morphological and syntactic ergative structures in Samoan. The chapter concludes with a discussion of the research focus for the studies to follow that investigate the use of key ergative features.

2.1. Ergativity

Dixon (1979) describes ergativity in terms of three syntactic-semantic roles: A, O, and S. A is the agent in a transitive clause. O is the patient in a transitive clause, and S is the sole argument of an intransitive clause. These three relations are treated in the grammar in various ways, or alignments. If a language treats A and S in the same way, and O in a different way, the language is said to have an an accusative alignment. This is the case in English. For example, an accusative pattern can be seen in word order. Take the transitive construction below in (2.1). 'The dog' is the agent (A) and is pre-verbal, while 'the man' is the patient (O) and is post-verbal. If the word order were to be switched, making 'the man' pre-verbal and 'the dog' post-verbal, the two no longer maintain the same syntactic-semantic relations, rendering the sentence ungrammatical, or rather, nonsensical in this respect.

(2.1)	The dog	bit	the man.		The man	bit	the dog
	A	V	**O**		***O**	V	**A**

Similarly, in an intransitive construction, as seen in (2.2), the sole argument (S), 'the man', is pre-verbal. If 'the man' were to be post-verbal, the sentence becomes ungrammatical.

(2.2)	The man	runs.		*Runs	the man.
	S	V		V	**S**

As shown in (2.1) and (2.2), A and S are able to occur in the pre-verbal position, while O must occur post-verbally. In this way, there is an A/S pivot, or an accusative pattern.

While an accusative morphosyntax patterns on an A/S pivot, an ergative morphosyntax patterns according to an S/O pivot. The sole argument of an intransitive construction (S) and the patient of an intransitive construction (O) are treated in the same way, while the agent of a transitive construction (A) is treated differently. This is true of case marking in Samoan, a VAO/VS language. As shown in the transitive construction in (2.3), the agent '*le tama*' (A) is marked with the case marker *e*, while the patient '*le teine*' (O) is unmarked.

(2.3)

Sā	*fasi*	***e***	*le*	*tama*	***ø***	*le*	*teine*
PST	hit	**ERG**	the	boy	**ABS**	the	girl

'The boy hit the girl.'

In the intransitive construction in (2.4a), the sole argument '*le teine*' (S) is unmarked, like the O in (2.3). The ergative case cannot mark S arguments (2.4b).

(2.4a)

Sā	*moe*	***ø***	*le*	*teine*
PST	sleep	**ABS**	the	girl

'The girl slept.'

(2.4b)

**Sā*	*moe*	***e***	*le*	*teine*
PST	sleep	**ERG**	the	girl

'The girl slept.'

As seen in (2.3) and (2.4), S and O can be unmarked, while A must be marked with the case marker *e*, demonstrating an S/O pivot, or an ergative pattern. This pattern of ergativity can occur at both the morphological and the syntactic level. The examples above exemplify morphological ergativity, where an ergative pattern is manifested on some morphological feature, namely case and agreement (Polinsky 2014:4). Syntactic ergativity, on the other hand, is manifested by any syntactic process that differentially picks outs absolutive arguments (S,O) to the exclusion of the ergative argument (A) (Polinsky 2014:5). The following sections discuss each type of ergativity in detail, demonstrating that Samoan exhibits a range of both morphological and syntactically ergative structures.

2.1.1 Morphological Ergativity

As defined by Polinsky (2014), morphological ergativity is the presence of an S/O pivot in the case marking and/or agreement systems of a language. Samoan exhibits morphological ergativity in both constructions, each of which is described here.

The first is the Samoan system of case marking, where only A is marked by the ergative case, while S and O are not (Table 2.1).

Table 2.1. The Ergative Case

	Case Marked
S	×
A	✓
O	×

The use of ergative case marking in Samoan is illustrated in (2.5) and (2.6), where in a basic intransitive construction (2.5), the sole argument of the verb *tamo'e* 'to run' (*le teine*, 'the girl'), is left unmarked, while in a transitive construction (2.6), the object of the verb is also left unmarked (*le teine*, 'the girl'), while the agent (*le tama*, 'the boy') is marked with the ergative case marker *e*.

(2.5)

'Olo'o	*tamo'e*	***ø***	*le*	*teine.*
PROG	run	**ABS**	the	girl

'The girl is running.'

(2.6)

'Olo'o	*si'i*	***e***	*le*	*tama*	***ø***	*le*	*teine*
PROG	lift	**ERG**	the	boy	**ABS**	the	girl

'The boy is lifting the girl.'

In this way, Samoan exhibits morphological ergativity in that the morphology (i.e. case) sets A apart from S and O by marking the A argument with *e* — a classic ergative pattern. This pattern is also seen in the system of agreement. In a Samoan transitive construction, the verb

agrees in number not with the agent (A), marked with the ergative case, but rather, with the unmarked (absolutive) argument, the patient (O), as seen in (2.7). In (2.7a), the plural verb agrees with the plural patient, and not with the singular agent. As can be seen in (2.7b), agreement with the agent (where the verb is singular, like the agent) results in ungrammaticality. Similarly, in (2.8), the verb agrees with the sole argument of an intransitive verb. This is an ergative pattern (Table 2.2).

(2.7a) *ʻUa nunuti e le tama ø fuāmoa.*
PRF crush.**PL** ERG the boy.SG ABS egg.**PL**
'The boy crushed the eggs.'
(Cook 1991:79)

(2.7b) **ʻUa nuti e le tama ø fuāmoa.*
PRF crush.**SG** ERG the boy.**SG** ABS egg.**PL**
'The boy crushed the eggs.'

(2.8) *ʻUa ō ø tamaiti i Sāmoa*
PERF go.**PL** ABS children.**PL** LOC Sāmoa
'The children have gone to Samoa.'
(Cook 1991:79)

Table 2.2. Ergative Agreement

	Plurality Indexed on verb
S	✓
A	✗
O	✓

Samoan, then, clearly exhibits morphological ergativity in both case and agreement. The following section turns to the manifestation of syntactic ergativity in Samoan.

2.1.2 Syntactic Ergativity

Syntactic ergativity is any syntactic process that differentially picks outs absolutive arguments (S,O) to the exclusion of the ergative argument (A). Samoan exhibits syntactic ergativity in a range of structures: quantification, clefting, *wh*-questions, relative clauses. All of these processes are described here.

The first is quantification involving the Samoan quantifier *'uma* 'all'. This quantifier can be floated where it occurs attached directly to the verb. In an intransitive construction, as exemplified in (2.9), where *'uma* directly follows the verb, the sole argument (S), *tamaiti* 'children', is quantified.

(2.9) *['Olo'o momoe **'uma]** tamaiti.*
PROG sleep.PL all children.PL
'All the children are sleeping.'

When the quantifier *'uma* is floated in a transitive construction, it is the O argument that is quantified, not the A ergative-marked argument. This is exemplified in (2.10) where *'uma* attaches directly to *fa'atau* 'buy' but applies only to the unmarked absolutive noun phrase *lole* 'candy'.

(2.10) *['Ua fa'atau **'uma]** e tamaiti lole.*
PRF buy **all** ERG children candy
'The children have bought all the candy.'
*'All the children have bought candy.'

Quantification, then, is an example of syntactic ergativity where a syntactic process sets A apart from S and O, in that only S and O fall under the scope of a floating quantifier (Table 2.3).

Table 2.3. Ergative Pattern of Floating Quantifier

	Associated with FQ
S	✓

A	✗
O	✓

This pattern also occurs in a set of three syntactic constructions (i.e. clefting, *wh*-questions, relativization), where two key ergative features set A apart from S and O (i.e. resumptive pronouns, transitive suffix *–ina*).

The first of these constructions is clefting. This is where one of the verb's arguments is fronted to a pre-verbal position and marked with the predicate marker *'o*. (2.11) presents an example of an intransitive clefting construction where the S argument (*le teine* 'the girl') is fronted and marked with *'o*. The verb then follows unchanged.

(2.11) S-Cleft:

'O le teine ['olo'o tamo'e].
PRD the girl PROG run
'As for the girl, she is running.'

An O-Cleft is constructed in a similar manner (2.12), where the O argument is fronted and marked with *'o*. The verb and remaining A argument follow unchanged.

(2.12) O-Cleft:

'O le teine ['olo'o si'i e le tama].
PRD the girl PROG lift ERG the boy
'As for the girl, the boy is lifting her.'

An A-Cleft, however, can trigger the optional use of a resumptive clitic pronoun, as well as the transitive suffix *–ina*. This is exemplified in (2.13), where the A argument (*le tama* 'the boy') is fronted, the resumptive pronoun *ia* occurs immediately following the tense-aspect marker and the transitive suffix *–ina* is attached to the verb. These features are not available in S and O-Clefts (Table 2.4).

(2.13) A-Cleft:

*‘O le tama [‘olo‘o **ia** si‘i**ina** le teine].*

PRD the boy PROG **PRN** lift***.ina*** the girl

‘As for boy, he is lifting the girl.’

Table 2.4. Ergative Pattern in Clefting

	Clitic Pronoun + *-ina*
S	×
A	✓
O	×

This is a syntactically ergative pattern where only the clefting of the A argument can trigger the use of a resumptive pronoun and the *-ina* suffix. This pattern is also seen in the formation of *wh*-questions. (2.14) presents an example of an S-WhQ, where the *wh*-word *‘ai* ‘who’ is marked by the predicate marker *‘o*, followed by the embedded clause.

(2.14) S-WhQ:

‘O ai [‘olo‘o tamo‘e]?

PRD who PROG run

‘Who is running?’

O-WhQs are formed in the same way, where the O *wh*-word is followed by the embedded clause with the verb and remaining A argument (2.15).

(2.15) O-WhQ:

‘O ai [‘olo‘o si‘i e le tama]?

PRD who PROG lift ERG the boy

‘Who is the boy lifting?’

A-WhQs (2.16), however, can trigger the use of a resumptive clitic pronoun and the transitive suffix *–ina* in the same way as A-Clefts, but not in S and O-WhQs (Table 2.5).

(2.16) A-WhQ:

‘O ai [‘olo‘o ***ia*** *si‘i****ina*** *le teine]?*

PRD who PROG **PRN** lift.***ina*** the girl

‘Who is lifting the girl?’

Table 2.5. Ergative Pattern in *Wh*-Questions

	Clitic Pronoun + *-ina*
S	×
A	✓
O	×

Again, this is a syntactically ergative phenomenon, setting apart the A argument. This pattern can once again be seen in relativization as well. (2.17) presents an S-RC, where the head noun is the S argument, followed by the relative clause with no resumptive clitic pronoun or verbal suffixation.

(2.17) S-RC:

le teine [‘olo‘o tamo‘e ____]

the girl PROG run GAP

‘the girl that is running’

O-RCs behave in the same way (2.18).

(2.18) O-RC:

le teine [‘olo‘o si‘i e le tama ____]

the girl PROG lift ERG the boy GAP

‘the girl that the boy is lifting’

A-RCs (2.19), in the same way as A-Clefts and A-WhQs, can trigger the use of a resumptive clitic pronoun and the transitive suffix *–ina*, but not S or O-RCs

(2.19) A-RC:

le tama [ʻoloʻo ***ia*** *siʻi****ina*** *le teine]*

the boy PROG **PRN** lift***.ina*** the girl

'the boy that is lifting the girl'

Relativization, then, is yet another manifestation of syntactic ergativity (Table 2.6).

Table 2.6. Ergative Pattern in Relativization

	Clitic Pronoun + *-ina*
S	×
A	✓
O	×

2.1.3 The Status of the *–ina* Suffix in Samoan

As an aside, it is important to note here that these syntactic environments are not the only place these features occur (i.e. transitive suffix *–ina,* resumptive clitic pronoun). The transitive suffix *–ina* can also occur in three other notable syntactic environments. The first is nominalization, exemplified in (2.20), where the verb is suffixed with *-ina* when it occurs with the article *le* 'the'.

(2.20) Nominalization:

*E tāua tele le aʻoaʻo****ina*** *o le gagana Sāmoa.*

PRS important very the teach***.ina*** GEN the language Samoa

'The teaching of the Samoan language is very important.'

The second syntactic environment is that of negation. Whether a simple negative declarative or negative imperative, *-ina* is often obligatory, as exemplified in (2.21).

(2.21a) Negative Declarative:

*E le'i fau**ina** e le tamāloa se fale.*
PRS NEG build.***ina*** ERG the man a house.
'The man hasn't built a house.'

(2.21b) Negative Imperative:
*'Aua 'e te toe fai**ina**.*
NEG 2S PRS again do.***ina***
'Don't do it again.'

The third syntactic environment is in conjunction with the use of a clitic pronoun. In declarative transitives, a clitic pronoun can optionally occur between the tense and the verb, as exemplified in (2.22). This often triggers the use of *–ina*, as well.

(2.22) *Na **ia** opo**(-ina)** ø le teine*
PST **3S** hug.***ina*** ABS the girl
'S/he hugged the girl.'

There is no consensus in the literature as to the sole function of the Samoan suffix *-ina*, leading some to describe it as the "mysterious transitive suffix" (Cook 1978)[1]. It appears to be triggered by a missing ergative argument, and often denotes increased transitivity. However, it is unfortunately beyond the scope of the current study to solve this mystery once for all. Nevertheless, it is clear that both of these features (i.e. *–ina* and clitic pronouns) set A apart from S and O in a range of structures, indicating a pattern of syntactic ergativity in Samoan.

2.2 Discussion

The previous sections clearly demonstrate that Samoan exhibits a robust system of ergativity both morphologically and syntactically. The issue now becomes the stability of this ergative

[1] Some have analyzed *-ina* as a type of passive (Downs 1949, Churchward 1951, Chung 1978), others have classed it as an ergativizing suffix (Mosel & Hovdhaugen 1992) or simply a marker of increased transitivity (Ota 1999). Yet another analysis puts forth the hypothesis that *-ina* marks a fronted ergative argument **(**Cook 1978).

system. Given the various syntactic environments where ergativity is manifested, how consistent are the production of these key features in fundamental structures? While Samoan ergativity has been described considerably in the literature (Mosel & Hovdhaugen 1992, Chung 1978, Cook 1998, Ochs 1982), the specific ergative features that make up the more general pattern have yet to be investigated experimentally as a whole to establish an overall measure of the regularity in the occurrence of these ergative features in the language. The chapters to follow seek to do this by addressing crucial issues surrounding Samoan ergativity.

The first is to investigate the frequency of these ergative features in the production of ergative structures by native speakers of Samoan. Does ergativity in Samoan manifest experimentally in the same way it is described in the literature? The second issue speaks to the typological observation that a language can exhibit morphological ergativity without syntactic ergativity; however, no languages exhibit syntactic ergativity without morphological ergativity (Dixon 1979). Given this universal, can any differences be observed in the production of morphological versus syntactic ergativity? While this is crucial entailment relationship has been substantiated in the description of Samoan in the literature, how might this manifest experimentally? And finally, the third and most probing issue investigates the stability of these ergative features. Are they a permanent fixture of the language impervious to substantial fluctuations in language input and exposure? Or is ergativity a fragile system that varies significantly across various speaker groups (i.e. native, heritage, L2)?

The chapters to follow seek to address these questions and more by empirically investigating the use of key ergative features in the production and grammaticality judgement of declaratives, *wh*-questions, and relative clauses. This investigation begins in the next chapter with an in-depth look at native speakers of Samoan.

Chapter 3. Experiment 1: Ergativity in Native Samoan

This chapter reports the results from a series of four experiments measuring the degree to which adult native speakers of Samoan produce and accept key morphological and syntactically ergative features (i.e. ergative case, transitive suffix -*ina*, and resumptive pronouns). Three of the experiments focused on production, while one focused on grammatical acceptability.

The first of the three production tasks was a declarative sentence completion task. The purpose of this task was to elicit the use of the ergative case marker in canonical declarative constructions. Participants were prompted to produce both intransitive and transitive constructions, where the ergative case would be used to mark the A argument. The second production task was *Wh*-Question Production, where participants were prompted to produce A, S, and O *wh*-questions. The purpose of this task was to elicit the transitive suffix -*ina* that occurs on the verb in A-WhQs, but not S- or O-WhQs. This task also elicited the ergative case that marks only the A argument in O-WhQs, but not S or O in S- or A-WhQs. The last of the production tasks was Relative Clause Production. Participants were prompted to produce S, A, and O relative clauses to elicit the same ergative features investigated previously in *wh*-questions, that is, the use of the transitive suffix –*ina* in A-RCs and the ergative case marker in O-RCs.

The final task was a Resumptive Pronoun Judgement Task. This was administered to measure the acceptability of resumptive pronouns in relative clauses to determine whether an ergative pattern would be observed. Participants were presented with a series of relative clauses, some with resumptive pronouns, some without. They were tasked with rating the grammaticality of each relative clause to determine whether resumptive pronouns would be accpeted in A-RCs, and rejected in S or O-RCs. This would show an ergative pattern in the use of resumptive prouns in relative clauses.

Collectively, the results of these tasks provide an overall picture of ergativity in the grammar of native speakers. Two important implications of these results are crucial to the current research. The first is to empirically confirm the description of Samoan ergative structures reported in the literature, and the second is to establish an experimental baseline in native Samoan speakers for comparison with heritage speakers in subsequent experiments.

3.1 Participants

The participants were 40 adult native speakers of Samoan (18 female, 22 male) from age 18 to 54. Thirty were tested in PagoPago, American Sāmoa, and ten were tested in Honolulu, Hawai‘i. All were first language speakers of Samoan, and bilingual in English to varying degrees. A cloze test was administered to ensure a comparable proficiency in Samoan. All participants performed at ceiling (see Appendix B).

3.2 Elicitation Tasks

Four experiments were administered: 1) Declarative Sentence Completion Task, 2) *Wh*-Question Production Task (Yoshinaga 1996, Tanaka et al 2016), 3) Relative Clause Production Task (Hsu et al 2009, Tanaka et al 2016), and 4) Resumptive Pronoun Judgement Task[2]. The sections that follow describe in detail the design, procedure, analysis, and results for each task.

3.2.1 Declarative Sentence Completion Task – Materials and Procedure

The purpose of this task was to measure the rate at which native speakers produce ergative case marking in declarative sentences, that is, marking A arguments with *e*, while leaving S and O arguments unmarked. To this end, participants were presented 10 test items (5 intransitive, 5 transitive) for which they were tasked with producing a declarative sentence describing each. An example of the two item types is presented in (3.1).

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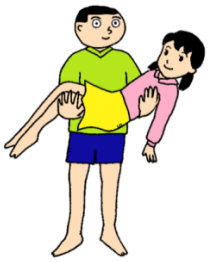
[2] It should be noted that Samoan exhibits two socially conditioned registers characterized by the use of *t* in one and *k* in the other. The *t*-register is employed in non-traditional contexts (e.g. orthography, church, school, media), while the *k*-register is employed in more traditional contexts (e.g. colloquial speech, cultural ceremony). The *k*-register, in addition to a change from *t* to *k*, also exhibits the collapse of *n* and *ŋ* to *ŋ*, as well as *r* and *l* to *l*. In addition, due to the rapid nature with which the colloquial *k*-register is spoken, phonetic effects (e.g. vowel elision and contraction, dropping of initial glottal stops) are also seen, which can often lead to the dropping of case marking. In contrast, the *t*-register is characterized by more careful and enunciated speech, where case marking, especially the ergative, is more stable (Ochs 1988, Mosel and Hovdhaugen 1992, Mayer 2001). For this reason, all tasks presented were conducted in the *t*-register.

(3.1) a) Intransitive Item b) Transitive Item



All items depicted animate characters. A total of 5 intransitive verbs were used (*tamo'e* 'run', *'ata* 'laugh', *nofo* 'sit', *tā'ele* 'bathe', *tū* 'stand'), along with 5 transitive verbs (*si'i* 'lift', *tūlei* 'push', *fa'asusū* 'spray', *fusi* 'hug', *tuli* 'chase'). The full set of items can be seen in Appendix C.

Task items were presented individually to each participant on a laptop screen. Participants were given the first portion of a declarative sentence by the researcher, in this case, the verb (i.e. TAM and verb). They were then tasked with completing the sentence, essentially producing the appropriate arguments of the verb as they pertained to the picture. The 5 intransitive items were presented first, followed by the 5 transitive items.

An example of the protocol for the transitive item presented in (3.2) is given here. The participant was first shown the picture on the laptop screen. The researcher then prompted the participant with the first portion of the sentence, in this case the verb: *'olo'o si'i* 'PROG lift'. The participant then completed the sentence by producing the two arguments with the appropriate case marking, in this case, the A argument, *e le tama* 'ERG the boy', and the O argument, *le teine* 'the girl' (1). Participants were free to choose the word order, case marking and lexical items that they preferred.

(3.2) Researcher Prompt: Expected Participant Response:

'Olo'o si'i...	*e le tama le teine.*
PROG lift	ERG the boy the girl

'The boy is lifting the girl.'

3.2.1.1. Predictions

For the intransitive items, the participants were expected to produce an unmarked S argument as the target structure. For the transitive items, they were expected to produce an ergative marked A argument with an unmarked O argument. Canonical word order was expected as well, VS and VAO; however, VOA is also possible if the ergative case marker is employed.

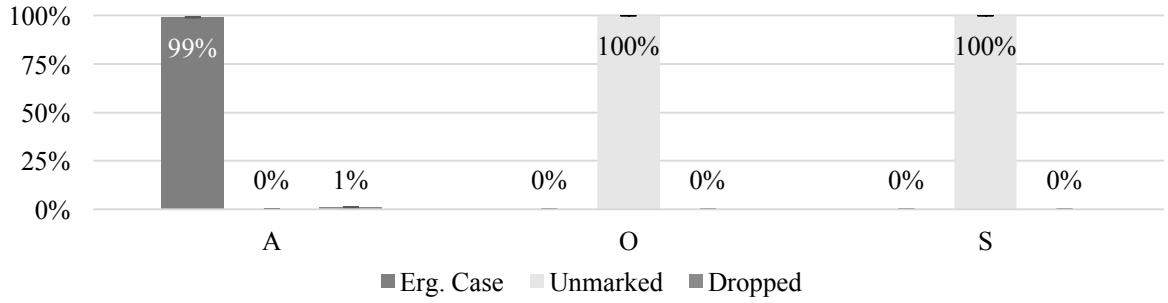
3.2.1.2 Analysis

All participant responses were audio recorded and later transcribed. Responses for each item were coded for case marking, namely the ergative case. The results are presented below.

3.2.1.3 Results

As presented in Figure 3.1, participants always produced both S and O arguments unmarked for case at 100%, while producing A arguments marked by the ergative case at a rate of 99%.

Figure 3.1. Declarative Completion Task Results



The 1% where the ergative case did not occur consisted of responses where the A argument was dropped (3.3). In that instance, the ergative case, then, is not required. They never, however, dropped the O argument.

(3.3) *'Olo'o si'i le teine.*
PROG lift the girl
'(The boy) is lifting the girl.'

3.2.1.4 Discussion

Participants consistently produced the ergative case to mark only A arguments in declarative sentences, and not S and O. This data demonstrates that native speakers exhibit morphological ergativity in declaratives as described in the literature. The following section expands on this phenomenon by presenting the tasks that investigated syntactic ergativity**.**

3.2.2 *Wh*-Question Production Task – Materials and Procedure

The purpose of this task was to investigate the production of two key ergative features in *wh*-questions, one morphological and the other syntactic. The first feature was the use of ergative case in O-WhQs to mark the A argument in the embedded clause (morphological, 3.4). The second feature was the use of the transitive suffix *–ina* in A-WhQs (syntactic, 3.5).

(3.4) O-WhQ (Ergative Case):

‘O ai ‘olo‘o si‘i e le tama?

PRD who PROG lift ERG the boy

‘Who is the boy lifting?’

(3.5) A-WhQ (Transitive Suffix *–ina*):

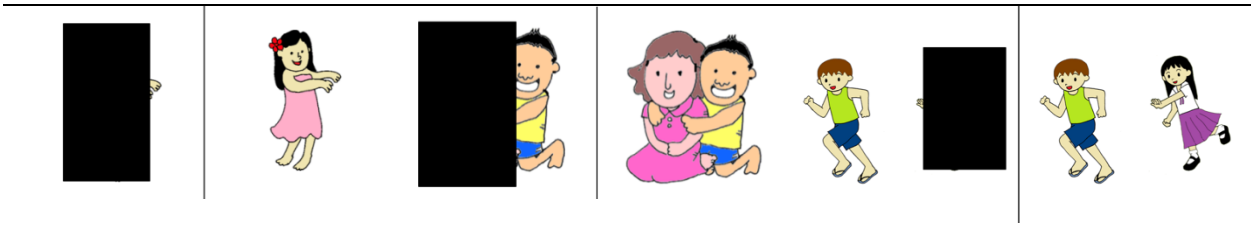
‘O ai ‘olo‘o si‘iina le teine?

PRD who PROG lift.*ina* the girl

‘Who is lifting the boy?’

Participants were shown a series of pictures where they were prompted to produce a *wh*-question as it pertained to the action depicted. There were a total of 15 items, 5 designed to elicit S-WhQs, 5 to elicit O-WhQs, and 5 to elicit A-WhQs. An example of each item type is presented in (3.6).

(3.6) a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item



All items depicted animate characters. A total of 5 intransitive verbs were used for the S-items (*tagi* 'cry', *tamo'e* 'run', *'ata* 'laugh', *nofo* 'sit', *tā'ele* 'bathe'), along with 10 transitive verbs for the O and A items, respectively (O: *'ini* 'pinch', *tāofi* 'stop', *'otegia* 'scold', *tūlei* 'push', *lagona* 'hear'; A: *si'i* 'lift', *tūlei* 'push', *fa'asusū* 'spray', *fusi* 'hug', *tuli* 'chase'). The full set of items can be seen in Appendix D.

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the participants the following prompt to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 3.1. The S items were presented first, followed by the O items, and then the A items.

Table 3.1. Examples of *Wh*-Question Prompts

Type	Prompt
S-Item	*'Olo'o siva se isi. Fesili mai po 'o ai.* PROG dance a other ask DIR PRT PRD who 'Someone is dancing. Ask me who.'
O-Item	*'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.* PROG hug ERG the boy a other ask DIR PRT PRD who 'The boy is hugging someone. Ask me who.'
A-Item	*'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.* PROG pull ERG a other the boy ask DIR PRT PRD who 'Someone is chasing the boy. Ask me who.'

3.2.2.1 Predictions

For the S items, participants were expected to produce a *wh*-question with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb in the embedded clause along with the remaining A argument marked by the ergative case. And finally, for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O argument in the embedded clause as the target structure. An example of each is given in Table 3.2.

Table 3.2. Examples of Predicted *Wh*-Question Responses

Type	Predicted Participant Repsonse
S-Item	*'O ai 'olo'o siva?* PRD who PROG run 'Who is dancing?'
O-Item	*'O ai 'olo'o fusi e le tama?* PRD who PROG hug ERG the boy 'Who is the boy hugging?'
A-Item	*'O ai 'olo'o tuliina le tama?* PRD who PROG chase.*ina* the boy 'Who is chasing the boy?'

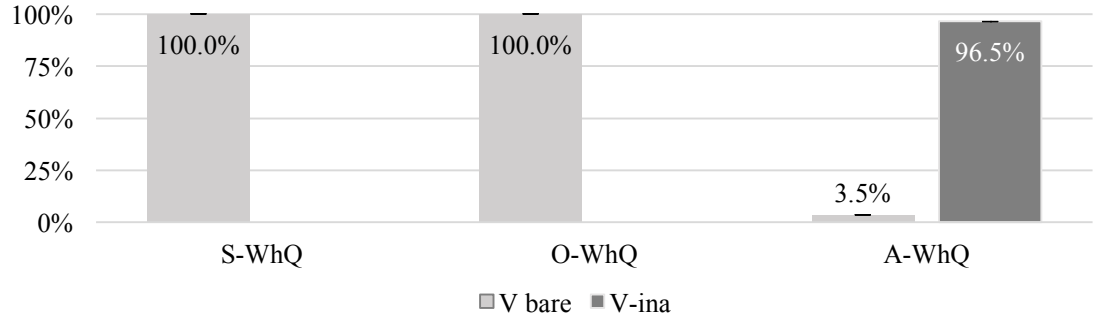
3.2.2.2 Analysis

All participant responses were audio recorded and later transcribed. Responses for each item were coded for the use of the ergative case marker, as well as the transitive suffix *–ina*. The results are presented in the following section.

3.2.2.3 Results

The results for the transitive suffix *–ina* are presented in Figure 3.2. Participants always produced S-WhQs and O-WhQs with bare verbs (i.e. no suffixation) at a rate of 100%. For A-WhQs, however, they produced the transitive suffix *–ina* on the verb at a rate of 96.5%.

Figure 3.2. WhQ Production: Trans. Suffix *-ina*



Bare verbs were produced in A-WhQs at a very low rate of 3.5% (7 tokens from 2 participants). An example of these responses is given in (3.6).

(3.6) A-WhQ without Transitive Suffix *–ina*

‘O ai ‘olo‘o si‘i le teine?

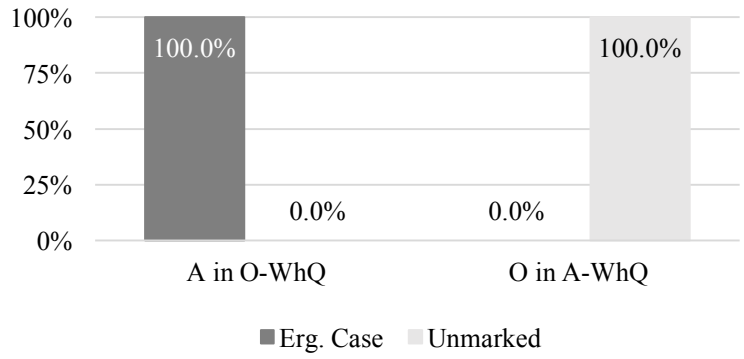
PRD who PROG lift the girl

‘Who is lifting the boy?’

While the use of *–ina* is preffered in A-WhQs, it is not completely obligatory. The small precentage of bare verbs observed here speaks to this variation in use. Nevertheless, the results strongly demonstrate a syntactically ergative pattern, in that a syntactic process, in this case, *wh*-question formation, distinguishes A as distinct from S and O.

In terms of morphological ergativity, Figure 3.3 presents the results for the use of ergative case to mark the remaining argument in the embedded clause. This would apply only to A arguments in O-WhQs (left column) and O arguments in A-WhQs (right column), as S-WhQs leave no overt argument in the embedded clause.

Figure 3.3. WhQ Production: Ergative Case



The results here show that participants always marked the A argument in O-WhQs with the ergative case, while always leaving the O argument in A-WhQs unmarked. This demonstrates a consistent pattern of morphological ergativity.

3.2.2.4 Discussion

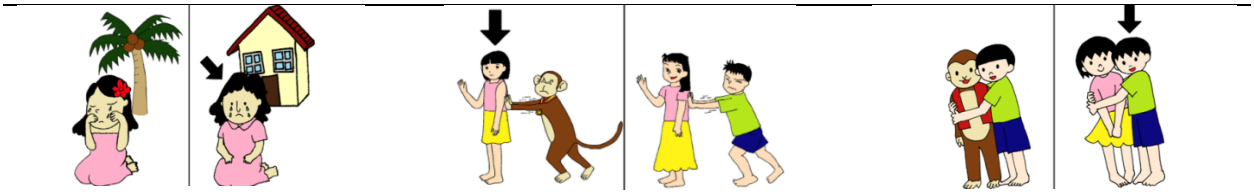
Participants consistently produce both syntactic (transitive suffix *–ina*) and morphological (ergative case) ergative features in the production of *wh*-questions. This is consistent with the description reported in the literature (Mosel & Hovdhaugen 1992). The following section reports similar results in the production of relative clauses.

3.2.3 Relative Clause Production Task – Materials and Procedure

Similar to the previous section on *wh*-questions, the purpose of this task was to investigate the production of the two key ergative features in relative clauses, that is the use of ergative case in O-RCs to mark the A argument within the relative clause (morphological), and the use of the transitive suffix *–ina* on the verb in A-RCs (syntactic).

Participants were shown a series of pictures where they were prompted to produce a relative clause to describe the action depicted. There were a total of 15 items, 5 designed to elicit S-RCs, 5 to elicit O-RCs, and 5 to elicit A-RCs. An example of each item type is presented in (3.7).

(3.7) a) S-RC Item b) O-RC Item c) A-RC Item



All items depicted animate characters. A total of 5 intransitive verbs were used for the S-items (*tagi* 'cry', *pa'ū* 'fall', *'ata* 'laugh', *nofo* 'sit', *tā'ele* 'bathe'), along with 10 transitive verbs for the O and A items, respectively (O: *'ini* 'pinch', *tāofi* 'stop', *toso* 'pull', *tūlei* 'push', *kiki* 'kick'; A: *si'i* 'lift', *tūlei* 'push', *fa'asusū* 'spray', *fusi* 'hug', *tuli* 'chase'). The full set of items can be seen in Appendix E.

Task items were presented individually to each participant. Participants were first shown the pictures without the arrow. They were then given a short description of the actions depicted on each side of the picture. After hearing the description, an arrow would appear on the screen

pointing to one of the characters depicted in the picture. The participant was then asked by the researcher, "Who is the arrow pointing to?". The participant would then respond by producing a relative clause. The S items were presented first, followed by the O items, and then the A items. An example of the protocol for each item is given in Table 3.

Table 3.3. Examples of Relative Clause Production Prompts

Type	Description	Prompt
S	*'Olo'o tagi le teine i luma o le niu.* PROG cry the girl in front of the coconut tree 'The girl is crying in front of the coconut tree.' *'Olo'o tagi le teine i luma o le fale.* PROG cry the girl in front of the house 'The girl is crying in front of the house.'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
O	*'Olo'o tūlei e le manukī le teine.* PROG push ERG the monkey the girl 'The monkey is pushing the girl.' *'Olo'o tūlei e le tama le teine.* PROG push ERG the boy the girl 'The boy is pushing the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
A	*'Olo'o fusi e le tama le manukī.* PROG hug ERG the boy the monkey 'The boy is hugging the monkey.' *'Olo'o fusi e le tama le teine.* PROG hug ERG the boy the girl 'The boy is hugging the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'

3.2.3.1 Predictions

For the S items, participants were expected to produce a relative clause with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb, along with an A argument marked by the ergative case. And finally for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O argument as the target structure. An example of each type of predicted response is presented in Table 3.4.

Table 3.4. Examples of Predicted Relative Clause Responses

Type	Predicted Participant Repsonse
S-Item	*le teine ʻoloʻo tagi i luma o le fale* the girl PROG cry in front of the house 'the girl that is crying in front of the house'
O-Item	*le teine ʻoloʻo tūlei e le manukī* the girl PROG push ERG the monkey 'the girl that the monkey is pushing'
A-Item	*le tama ʻoloʻo fusiina le teine* the boy PROG hug.*ina* the girl 'the boy that is hugging the girl.'

3.2.3.2 Analysis

All participant responses were audio recorded and later transcribed. Responses for each item were coded for the use of the ergative case marker, as well as the transitive suffix *–ina*. The results are presented in the following section.

3.2.3.3 Results

The results for the transitive suffix *–ina* are presented in Figure 3.4. Participants always produced S-RCs and O-RCs with bare verbs (i.e. no suffixation) at rate of 100%. For A-RCs, however, they produced the transitive suffix *–ina* on the verb at a rate of 79.5%, producing bare verbs 20.5% of the time (41 tokens from 11 participants) (3.8).

(3.8) A-RC without Transitive Suffix *–ina*

le tama ʻoloʻo fusi le teine

the boy PROG hug the girl

'the boy that is hugging the girl.'

While these results are not as robust as those observed in *wh*-questions, they nevertheless demonstrate a syntactically ergative pattern, where relativization as a syntactic process distinguishes A as distinct from S and O, in that only A arguments trigger the use of the transitive suffix *–ina*.

Figure 3.4. RC Production: Trans. Suffix *-ina*

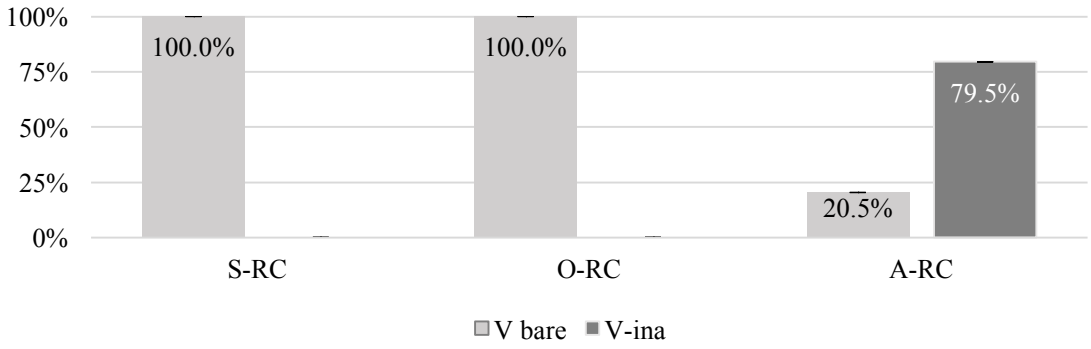
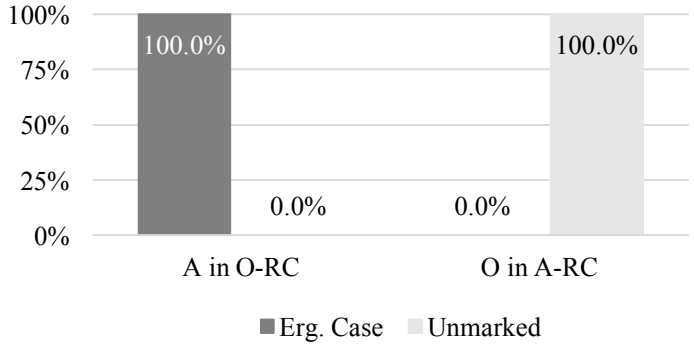


Figure 3.5 presents the results for the use of ergative case to mark the remaining argument in the embedded clause. Similar to *wh*-questions, this would apply only to A arguments in O-RCs (left column) and O arguments in A-RCs (right column), as S-RCs leave no overt argument in the embedded clause.

Figure 3.5. RC Production: Ergative Case



These results show that participants consistently marked the A argument in O-RCs with the ergative case, while always leaving the O argument in A-RCs unmarked. This demonstrates a pattern of morphological ergativity similar to that which was observed in *wh*-questions.

3.2.3.4 Discussion

Participants produce both syntactic (transitive suffix *–ina*) and morphological (ergative case) ergative features in the production of relative clauses. While *–ina* only occurred in A-RCs, establishing it as an ergative feature, the fact that *–ina* was not produced at a higher rate (when compared to *wh*-questions) may speak to its optionality in relative clauses. It may also speak to the fact that although *wh*-questions and relative clauses are strikingly similar in surface form, underlyingly, they are indeed distinct constructions. Nevertheless, these results are indeed consistent with the description reported in the literature. There is one feature discussed in the literature, however, that did not appear here in these results; and that is the optional use of a resumptive pronoun in A-RCs. Of the 600 relative clause responses (200 of each type – S, A, and O), participants never produced a resumptive pronoun. This result speaks to the optionality of resumptive pronouns in relative clauses (Mosel & Hovdhaugen 1992). However, despite its absence in elicited production, the last elicitation, described in the following section, sought to elicit sensitity to resumptive pronouns in grammaticality judgements.

3.2.4 Relative Clause Resumptive Pronoun Judgement Task – Materials and Procedure

As reported in the literature, resumptive pronouns can only occur in A-gaps, not S- and O-gaps (RCs, *Wh*-questions, Clefts). The purpose of this task was to investigate whether this

syntactically ergative pattern could be observed in native speakers' grammaticality judgements of resumptive pronouns in relative clauses, that is, would participants accept A-RCs with resumptive pronouns, but reject S and O-RCs with resumptive pronouns?

To this end, participants were presented with a series of sentences and asked to rate the grammaticality of each sentence on a five point Likert scale. There were 6 test sentence types that were presented as a part of this task: each RC type (S, A, and O), with and without a resumptive pronoun. An example of each type can be seen in Table 3.5.

Table 3.5. Examples of Judgement Task Test Items

	Without Resumptive Prn	**With Resumptive Prn**
S	*le teine [ʻoloʻo ʻata]* the girl PROG laugh 'the girl that is laughing'	**le teine [ʻoloʻo ia ʻata]* the girl PROG 3S laugh 'the girl that is laughing'
O	*le teine [ʻoloʻo siʻi e le tama]* the girl PROG lift ERG the boy 'the girl that the boy is lifting'	**le teine [ʻoloʻo ia siʻi e le tama]* the girl PROG 3S lift ERG the boy 'the girl that the boy is lifting'
A	*le teine [ʻoloʻo tosoina le tama]* the girl PROG pull.*ina* the boy 'the girl that is pulling the boy'	*le teine [ʻoloʻo ia tosoina le tama]* the girl PROG 3S pull.*ina* the boy 'the girl that is pulling the boy'

There were four tokens of each type, for a total of 24 test items. Also included were 24 filler items. These consisted of three types of declarative sentences: canonical declaratives, quantified declaratives, and declaratives using clitic pronouns. These fillers were selected as controls to ensure the validity of the test item responses, as well as to obscure the target structures fom the participants themselves. Canoncial declaratives were chosen as the most basic items to ensure participants were sensitive to VS/VAO word order. Quantified declaratives were included as a slightly more complex, yet still fundamental, variation of canonical declaratives, where a numerical quantity occurred modifying a core argument. Finally, declaratives using clitic pronouns were included where participant responses would reveal sensitivity to core arguments occuring as clitic pronouns in constructions other than relative clauses. A grammatical and ungrammatical version of each type was included in the task. Each of these filler types were included as constructions without any direct involvement with

ergativity. An example of each is presented in Table 3.6. With both test and filler items combined, the task consisted of a total of 48 items.

Table 3.6. Examples of Judgement Task Filler Items

	Grammatical	**Ungrammatical**
Cann.	*E poto tele le tama lea.* PRS smart very the boy this 'This boy is very smart.'	**'Ua pē le tuai ta'avale lea.* PRF die the old car this 'This old car has died.'
Quant.	*Sā va'ai le teine 'i le ta'avale e tasi.* PRS see the girl OBL the car PRS one 'The girl saw one car.'	**E mana'o le tama 'i tolu tusi.* PRS want the boy OBL three book 'The boy wants three books.'
Cl. Prn.	*'E te fiafia e faitau tusi.* 2S PRS like PRS read book 'You like to read books.'	**'Ua ia nofo i luga o le ta'avale.* PRF 3S sit on top of the car 'S/he has sat on top of the car.'

Test and filler items were presented together. The order in which they were presented was randomized using Excel. Items were read aloud individually to the participant. After each item was read, the participant rated the grammaticality of the sentence by circling the appropriate number on the judgement task form (see Appendix F).

3.2.4.1 Predictions

For the filler items, the participants were expected to give a low rating for the ungrammatical versions of each sentence type. For the test items, participants were expected to give low ratings to both S and O-RCs with resumptive pronouns, while giving high ratings to S and O-RCs without resumptive pronouns. On the other hand, they were expected to give high ratings to all A-RCs, both with and without resumptive pronouns.

3.2.4.2 Results and Analysis

The results of the judgement task are displayed in Tables 3.7 and 3.8. Table 3.7 presents the results from the filler items. Participants performed as expected, giving high ratings to the grammatical sentences, while giving lower ratings to the ungrammatical sentences. These

results, then, show that this task elicited accurate grammaticality judgements from the participants.

Table 3.7. Judgement Task Results: Filler Items.

Declarative Type	Mean Score	SD
Canonical	4.68	.95
*Canonical	2.04	1.40
Quantified	4.14	1.32
*Quantified	2.06	1.33
Clitic Pronoun	4.07	1.34
*Clitic Pronoun	3.36	1.66

Table 3.8 presents the results from the experimental test items. Participants gave high ratings to all A-RCs, both with and without the resumptive pronoun. However, for both S and O-RCs, higher ratings were given to those without the resumptive pronoun.

Table 3.8. Judgement Task Results: Test Items.

RC-Type	Mean Score		SD
A-RC w/o prn	4.21		1.32
A-RC w prn	4.14		1.28
O-RC w/o prn	4.16		1.33
O-RC w prn	2.67	*	1.67
S-RC w/o prn	4.24		1.26
S-RC w prn	2.99	*	1.50

* $p < 0.05$

A paired t-test was conducted to compare the +resumptive condition and the –resumptive condition, in A-RCs, O-RCs and S-RCs. For A-RCs, the difference between +resumptive and –resumptive was found to be statistically insignificant ($p=0.31$), while in the O-RC and S-RC

conditions, the difference was found to be significant ($p<0.05$ in both conditions). These results demonstrate that native speakers show a difference between sentences with resumptives and sentences without resumptives between A-RCs on the one hand and S-RCs and O-RCs on the other. In the former group (A-RCs), native speakers show no difference in sentences with or without resumptives, while in the latter group, native speakers rate sentences without resumptives higher than those with resumptives.

3.2.4.3 Discussion

These results are conistent with the ergative description of Samoan relative clauses in the literature, that is, only A arguments can trigger an optional resumptive pronoun, not S and O. It is clear here that although native speakers did not produce resumptive pronouns in the Relative Clause Prodution Task, they are indeed sensitive to the ergative restrictions surrounding the use of resumptive pronouns in relative clauses.

3.3 General Discussion

The tasks presented in this chapter each make a key contribution to understanding the various facets of ergativity in Samoan. It is clear that native speakers consistently produce morphological ergative features (i.e. ergative case) not only in canonical declaratives, but also *wh*-questions and relative clauses. It is also clear from these results that native speakers produce syntactic ergative features (i.e. transitive suffix *–ina*) in both *wh*-questions and relative clauses. Moreover, native speakers show sensitivity to the syntactally ergative pattern of resumptive pronouns in relative clauses.

Collectively, the results from these tasks demonstrate two key points. The first is that both morphological and syntactic ergative features are robust in native Samoan. The rates of ergativity observed here will be used in subsequent studies as a baseline to meaure the presence of ergativity in other speaker groups. The second is that the methodology implemented in this chapter served as an efficient tool with which to both elicit and measure ergative features. This set of elicitation tasks are used in the studies to follow in the investigation of ergativity in heritage speakers of Samoan.

Chapter 4. Experiment 2: Ergativity in Heritage Samoan

In Chapter 3, we empirically established the intrinsic role of ergativity in native Samoan grammar. The participants in experiment 1 were those that had been exposed (uninterupted) to Samoan as a first language (L1) from childhood. They had acquired an intricate grammatical system (i.e. phonology, morphology, syntax, pragmatics, etc.) that they share with others within their speech community. This allows them to transmit ideas with ease, interpret language input, as well as pass on their linguistic knowledge intergenerationally to fellow members of their community. In addition, they are able to recognize other native speakers of their language due to the unique features shared within their common grammar (i.e. pronounciation, vocabulary, idioms, etc.). Much of the literature in the field of language acquisition has focused on the development of the prototypical native speaker (L1 acquisition), that is, the process by which a child learning one language from birth, gradually acquires the necessary linguistic tools to eventually become a fully functioning member of their speech community. While L1 acquisition research is indeed essential,[3] and has contributed fundamentally to the field, this is not the totality of the human experience as a language learner.

Acquitision research has since expanded to focus on the development of various other types of language learners. This includes children who begin to learn a second language between the ages of 6 and 8 (i.e. child L2), adult speakers of one language who then begin to learn a second language after the critical period (i.e. adult L2), as well as adults who have learned two languages from birth (i.e. bilinguals). Each of these learner types offer unique perspectives into many facets of language development. Another type of language learner that has only recently begun to receive attention in acquisition literature is the heritage speaker.

Heritage speakers are those who, from birth, are raised in a bilingual or multilingual environment. Acquisition of their L1, often a minority language, subsequently shifts to another language (i.e. the majority language) at around the ages of 4 – 6 years due to a change in language input and exposure, usually as a result of formal schooling (Benmamoun et al. 2013). This often results in speakers who are much more proficient in the majority language than their heritage language. Heritage speakers, then, offer a unique opportunity to investigate the

[3] In fact, see Muāgututi'a, Deen & O'Grady (2016), reviewed briefly below, for a study that investigates the acquisition of ergativity in child Samoan.

persistence of particular aspects of specific grammatical systems in the face of reduced language input. This chapter seeks to do just this, by examining the presence of ergativity in heritage speakers of Samoan given the prominence of English, an accusative language.

The chapter begins with an overview of heritage language and its contriubtion to the field of language development, followed by the presentation of a study designed to investigate the extent to which adult heritage speakers of Samoan produce and accept key ergative features in declaratives, *wh*-questions, and relative clauses. The results presented here show a clear deviation by heritage speakers from native-like use of both morphological and syntactic ergative features, revealing a crucial gap in Samoan heritage grammar.

4.1. Heritage Speakers.

Heritage speakers represent a unique type of language learner, and are usually considered to be second generation immigrants (i.e. children of original immigrants), who have lived in a bilingual or multilingual environment from an early age. Heritage speakers are those that grow up hearing and speaking their heritage language at home in early childhood as their L1, but at the onset of schooling, roughly around age 5, their primary language shifts to their L2, that is, the majority language. By adulthood, this results in heritage speakers that are often much stronger in the majority language, and much weaker in their heritage language (Benmamoun, Montrul, & Polinsky 2013). Because of this language shift, often near critical periods of language development, heritage speakers offer a unique opportunity to address the persistence of linguistic features acquired in early childhood as a part of their L1 that may have later attrited as a result of reduced exposure to their L1 due to the pervasive effects of the majority language, their L2.

Research in heritage language, then, can contribute to theoretical linguistics by revealing the most resilient features of universal principles of language structure in cases of reduced input (e.g. phrase structure, word order as opposed to inflectional morphology; Benmamoun, Montrul, & Polinsky 2013), as well as experimental linguistics by investigating the elicitation of key linguistic features in both comprehension and production. Moreover, heritage language research can also contribute to the field of L1 acquisition by establishing essential characteristics of typical versus abated development, as well as L2 acquisition, by allowing the analysis and comparison of the many grammatical facets of L1, L2, and heritage development.

For example, recent studies have shown that heritage speakers perform well when it

comes to phonology (Bowers et al. 2009, Oh et al 2010), however, are noticeably vulnerable when it comes to inflectional morphology (Benmamoun, Montrul, & Polinsky 2013). This suggests that phonological features may be more durable once acquired than their morphological counterparts. Syntactically, heritage speakers have shown that often the basics of core grammatical features are most resilient. This was shown for a number of phenomena in accusative languages (e.g. V2 word order in Swedish, Hakansson 1995; overt pronominals in Russian, Polinsky 1997; subject-verb inversion in Spanish, Montrul 2008). However, there has been a conspicuous lack of research on ergativity in heritage language, with only two published studies that look specifically at ergative features in the grammars of heritage speakers.

The first is a study that investigated the persistence of ergativity in heritage speakers of Dyirbal, an endangered indigenous language of Australia. Schmidt (1985) investigated ergative suffixation and clause coordination in the grammar of 12 heritage speakers of Dyirbal between the ages of 15 – 39 years of age. She presented each a standard set of stimulus sentences in English that the participant was tasked to translate in Dyirbal. The stimulus sentences were designed in a way to elicit two ergative structures when translated into Dyirbal. The first was morphological: ergative case marked by an inflectional suffix, and the second was syntactic: an S/O pivot in clause coordination. The results revealed a continuum along which speakers could be placed based on grammatical complexity of their responses in Dyirbal. It was shown that ergative features did not persist throughout the entire continuum. In fact, morphological ergativity (i.e. ergative case) persisted to only about halfway along the continuum. Syntactic ergativity (i.e. clause coordination) was lost at a much earlier point. This finding demonstrates that ergativity in Dyirbal is a fragile system particularly susceptible to attrition, syntactic ergativity even more so than morphological ergativity.

A similar finding was observed in the later study, where the persistence of ergative case was investigated in the grammar of Hindi heritage speakers. Montrul et al. (2012) elicited short oral narratives from 28 heritage speakers of Hindi (ages 18 – 35), and also administered a bimodal acceptability judgement task, where they manipulated the use of the ergative case. They found that heritage speakers produced the ergative case at a low rate of 56.74%. This was significantly lower than the native controls, who produced the ergative case at 95.98%. They also found that heritage speakers were significantly less discriminatory than native speakers in their judgement of the ungrammatical use of the ergative case in declarative transitives (i.e

omission and overgeneralization). These results further support the idea that ergativity is indeed a fragile feature, particularly susceptible in heritage grammar.

The studies from both Dyirbal and Hindi may hint at what might be observed in Samoan. Unfortunately, there has yet to be a study investigating ergativity in the heritage speakers of Samoan; however, a look at previous studies from Samoan L1 acquisition might shed light into what might be expected for the current study. Ochs (1982) conducted the first study on the acquisition of Samoan by investigating the production of morphological ergativity in Samoan by monolingual children. She found that in child naturalistic speech (5 children, aged 2-4yrs) the ergative case marker rarely appeared (<5% of total corpus; <15% in obligatory contexts). She attributes this to the sociological variability in the use of the ergative case marker: ergative case appears most frequently amongst men and least amongst women, and more frequently in interactions with those outside of the household and least frequently with those within the household. These sociological factors then limit the children's exposure to the ergative case marker, thus delaying its acquisition. A more recent study (Muāgututi'a, Deen, and O'Grady 2016) investigated the use of both the ergative case marker in declaratives (i.e. morphological ergativity) and the transitive suffix *-ina* in relative clauses (i.e. syntactic ergativity). It was found that although children do appear to have some knowledge of ergativity early on, consistent use of these features do not occur until after the age of 7, affirming Samoan ergativity as a late acquisition. This suggests that ergative features in heritage Samoan may also be particularly fragile in the same way observed in Dyirbal and Hindi.

A unique opportunity, then, has presented itself here to contribute to the heritage language literature by investigating the persistence of Samoan ergativity in the face of attrition and incomplete acquisition as a result of reduced input. The following section presents the current study where key ergative features were empirically investigated in the grammar of adult Samoan heritage speakers.

4.2. Heritage Experiment

This section presents a study investigating ergative case marking, the transitive suffix *–ina*, and resumptive pronouns in declaratives, *wh*-questions, and relative clauses in adult heritage Samoan.

4.2.1 Participants

The participants were 45 adult heritage speakers of Samoan (18 female, 22 male) from age 18 to 54. Thirty were tested in Southern California, and fifteen were tested in Honolulu, Hawai‘i. All were either born outside of Samoa or born in Samoa and immigrated to the United States before the age of 7. A language background survey established their language profile as fitting that of a heritage speaker (see Appendix A). A cloze test was also administered to ensure a comparable proficiency in Samoan amongst participants (scores ranged from 73% - 100% with an average score of 89% – see Appendix B for complete results).

4.2.2 Materials and Design

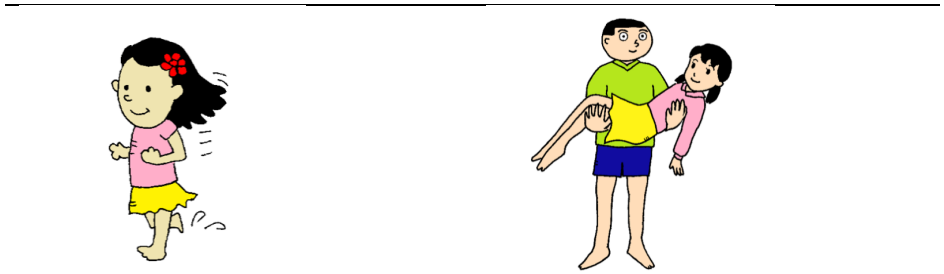
The same 4 experiments used with the native speaker group from Chapter 4 were administered: 1) Declarative Sentence Completion Task, 2) Wh-Production Task, 3) Relative Clause Production Task, and 4) Resumptive Pronoun Judgement Task. The results of each task are presented in the following sections, with comparisons made with the results found in the native speaker group.

4.2.3 Declarative Sentence Completion Task

This was the exact same task presented in the previous chapter. The purpose was to measure the rate at which participants produce ergative case marking in declarative sentences (i.e. marking A arguments with *e*, while leaving S and O arguments unmarked). Participants were presented 10 test items (5 intransitive, 5 transitive) for which they were tasked with producing a declarative sentence describing each. An example of the two item types is presented in Figure 4.1.

Figure 4.1. Sample of intransitive and transitive pictures

a) Intransitive Item b) Transitive Item



All items depicted animate characters. A list of the verbs used are listed in Table 4.1. The full set of items can be seen in Appendix C.

Table 4.1. Elicited Verbs for Declarative Completion Task

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo‘e*	‘run’	1.	*si‘i*	‘lift’
2.	*Nofo*	‘sit’	2.	*tūlei*	‘push’
3.	*‘ata*	‘laugh’	3.	*toso*	‘pull’
4.	*tā‘ele*	‘bathe’	4.	*fa‘asusū*	‘spray’
5.	*tū*	‘stand’	5.	*fusi*	‘hug’
6.	*tagi*	‘cry’	6.	*tuli*	‘chase’
7.	*tā‘alo*	‘play’	7.	*kiki*	‘kick’
8.	*siva*	‘dance’	8.	*matamata*	‘watch’
9.	*pa‘ū*	‘fall’	9.	*‘ini*	‘pinch’
10.	*oso*	‘jump’	10.	*tāofi*	‘stop’
11.	*faitau*	‘read’	11.	*‘u‘u*	‘hold’
12.	*ti‘eti‘e*	‘ride’	12.	*lagona*	‘hear’

Task items were presented individually to each participant on a laptop screen. Participants were given the first portion of a declarative sentence by the researcher, in this case, the verb (i.e. TAM and verb). They were then tasked with completing the sentence, essentially producing the appropriate arguments of the verb as they pertained to the picture. The 5 intransitive items were presented first, followed by the 5 transitive items.

An example of the protocol for the transitive item presented in Fig 4.1(b) is given here. The participant was first shown the picture on the laptop screen. The researcher then prompted the participant with the first portion of the sentence, in this case the verb: *‘olo‘o si‘i* ‘PROG lift’. The participant then completed the sentence by producing the two arguments with the appropriate case marking, in this case, the A argument, *e le tama* ‘ERG the boy’, and the O argument, *le teine* ‘the girl’ (4.1).

(4.1) Researcher Prompt: Expected Participant Response:

'Olo'o si'i... *e le tama le teine.*

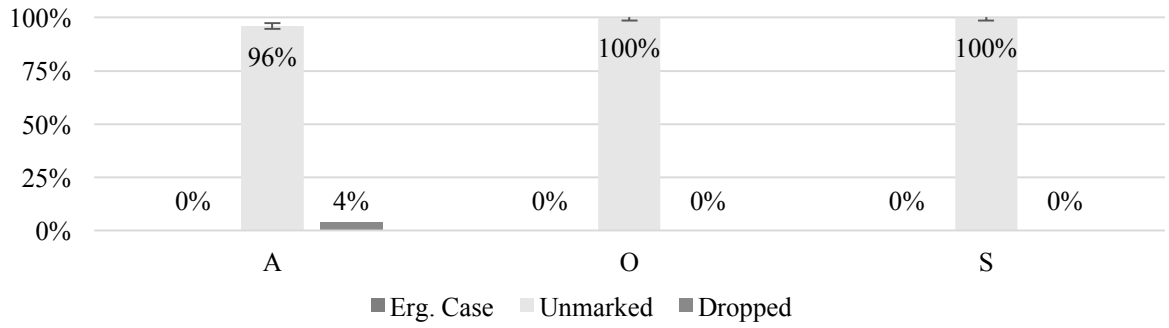
PROG lift ERG the boy the girl

'The boy is lifting the girl.'

4.2.3.1 Results

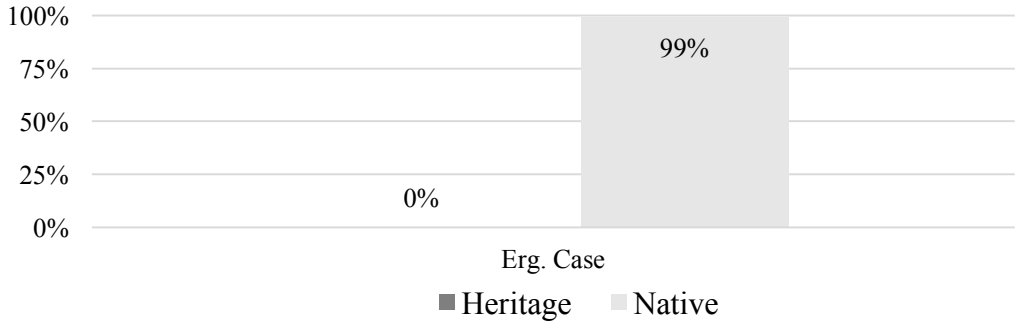
The results for the Declarative Task are presented in Figure 4.2. Participants always produced both S and O arguments unmarked in the same way as the native speakers. However, heritage speakers also produced A arguments unmarked, unlike the native speakers. They dropped the A-argument altogether 4% of the time, but when they did produce an overt A-argument (the remaining 96% of the time), it always occurred unmarked.

Figure 4.2. Heritage: Declarative Completion Task Results



When ergative case marking on A-arguments by heritage speakers are compared with those from native speakers (Figure 4.3), there is a stark difference.

Figure 4.3. Heritage vs Native: Ergative Case in Transitive Declaratives



Native speakers produce the ergative case 99% of the time, while heritage speakers produce ergative case 0% of the time. This is a clear deviation from native-like use.

4.2.3.2 Discussion

These results show that unlike native speakers, morphological ergativity (i.e. case) is essentially absent from the grammar of heritage speakers. This suggests that heritage speakers are not relying on case marking to signal thematic roles; instead, it appears that they may be relying on word order. As disscussed in Chapter 2, canonical word order in Samoan is VAO; however, VOA is also allowed, as the ergative case marker distinguishes the A from the O argument (4.2, 4.3).

(4.2) VAO:

'Olo'o si'i e le tama le teine.
PROG lift ERG the boy the girl
'The boy is lifting the girl.'

(4.3) VOA:

'Olo'o si'i le tama e le tama.
PROG lift the boy ERG the boy
'The girl is lifting the boy.'

The heritage speakers, however, produce transitive declaratives without the ergative case marker to distinguish the two arguments. Without any contextual reference, this results in an ambiguous sentence (4.4).

(4.4) No ergative case marker: VAO or VAO?

‘Olo‘o si‘i le tama le teine.

PROG lift the boy the girl

‘The boy is lifting the girl.’ or ‘The girl is lifting the boy.’

However, after inspecting each item and comparing the lexical items in each response to the target picture, it was found that 100% of responses matched the VAO order. Heritage speakers never produced VOA. This suggests that heritage speakers are relying solely on word order rather than case to signal thematic role (VS / VAO). In this way, the immediate post-verbal position is reserved for S and A, while O is placed in the second post-verbal position. This is an accusative pattern where S and A are treated the same, while O is treated differently, perhaps due to influence from English, a language where a fixed word order reserves the preverbal position for S and A and the post verbal for O.

It appears, then, that heritage speakers do not exhibit morphological ergativity (i.e. ergative case), but perhaps instead accusativity (i.e. fixed word order). The next section expands on these results by investigating the status of syntactic ergativity in *wh*-questions.

4.2.4 *Wh*-Question Production Task

The same *Wh*-Question Production Task used in the previous chapter with the native speakers was again administered here with the heritage speakers. The purpose of this task was to investigate the production of two key ergative features in *wh*-questions, one morphological and the other syntactic. The first feature was the use of ergative case in O-WhQs to mark the A argument in the embedded clause (morphological, 4.5). The second feature was the use of the transitive suffix *–ina* in A-WhQs (syntactic, 4.6).

(4.5) O-WhQ (Ergative Case):

‘O ai ‘olo‘o si‘i e le tama?

PRD who PROG lift ERG the boy

‘Who is the boy lifting?’

(4.6) A-WhQ (Transitive Suffix *–ina*):

‘O ai ‘olo‘o si‘iina le teine?

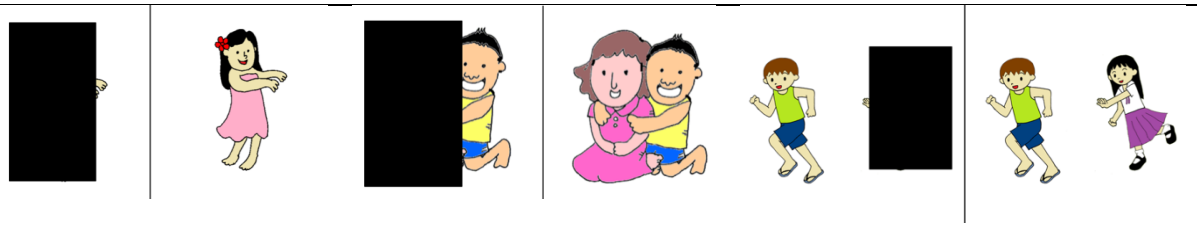
PRD who PROG lift.*ina* the girl

‘Who is lifting the boy?’

Participants were shown a series of pictures where they were prompted to produce a *wh*-question as it pertained to the action depicted. There were a total of 15 items, 5 designed to elicit S-WhQs, 5 to elicit O-WhQs, and 5 to elicit A-WhQs. An example of each item type is presented in Figure 4.4.

Figure 4.4. Sample of elicitation items from the *Wh*-Question Production Task

a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item



All items depicted animate characters. A list of the verbs used are listed in Table 4.2. The full set of items can be seen in Appendix D.

Table 4.2. Elicited Verbs for *Wh*-Question Production Task

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the participants the following prompt (in Samoan) to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 4.3. The S items were presented first, followed by the O items, and then the A items.

Table 4.3. Examples of *Wh*-Question Prompts

No.	Type	Prompt
(4.7)	S-WhQ Item:	*'Olo'o siva se isi. Fesili mai po 'o ai.* PROG dance a other ask DIR PRT PRD who 'Someone is dancing. Ask me who.'
(4.8)	O-WhQ Item:	*'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.* PROG hug ERG the boy a other ask DIR PRT PRD who 'The boy is hugging someone. Ask me who.'
(4.9)	A-WhQ Item:	*'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.* PROG pull ERG a other the boy ask DIR PRT PRD who 'Someone is chasing the boy. Ask me who.'

For the S items, participants were expected to produce a *wh*-question with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb in the embedded clause along with the remaining A argument marked by the ergative case. And finally for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O argument in the embedded clause as the target structure. An example of each is given in Table 4.4.

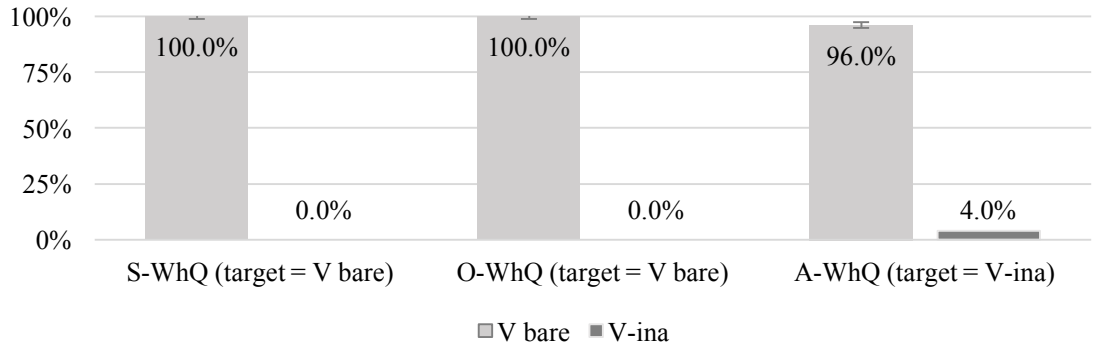
Table 4.4. Examples of Predicted *Wh*-Question Responses

No.	Type	Predicted Participant Repsonse
(4.10)	S-WhQ Item	*'O ai 'olo'o siva?* PRD who PROG run 'Who is dancing?'
(4.11)	O-WhQ Item	*'O ai 'olo'o fusi e le tama?* PRD who PROG hug ERG the boy 'Who is the boy hugging?'
(4.12)	A-WhQ Item	*'O ai 'olo'o tuliina le tama?* PRD who PROG chase.*ina* the boy 'Who is chasing the boy?'

4.2.4.1 Results

The results for the use of the transitive suffix *–ina* by heritage speakers are presented in Figure 4.5. While heritage speakers produced bare verb for both S and O-WhQs as expected, they only produced *–ina* in A-WhQs 4% of the time. The vast majority of A-WhQs (96%) were produced with bare verbs.

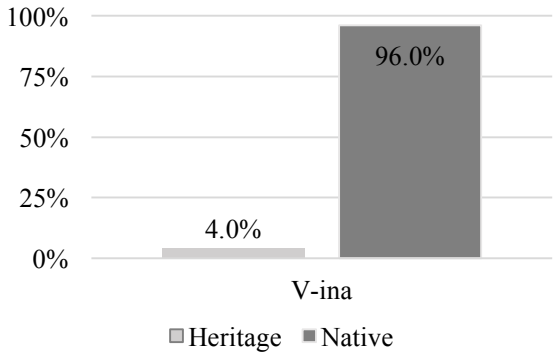
Figure 4.5. Heritage WhQ Production: Trans. Suffix *-ina*



When heritage speakers' use of *–ina* in A-WhQs is compared with that of native speakers (Fig. 4.6), it is clear that heritage speakers deviate significantly from native-like use. Native speakers almost always produced *–ina* (96.5%), while heritage speakers almost never produced

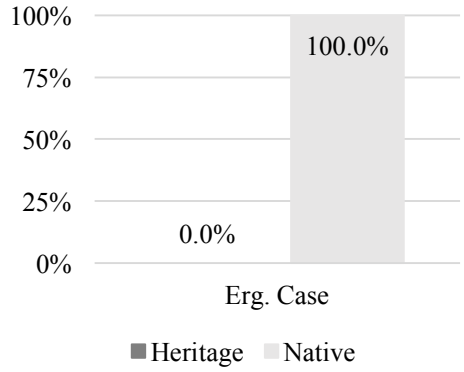
the suffix (4%). Heritage speakers, then, do not exhibit syntactic ergativity in the production of *wh*-questions, unlike their native speaker counterparts.

Figure 4.6. Heritage WhQ Production: A-WhQs



In terms of morphological ergativity, Figure 4.7 shows that while native speakers always produced the ergative case in O-WhQs, heritage speakers never did. This is a clear lack of morphological ergativity in the heritage speaker group.

Figure 4.7. Heritage: Erg. Case in O-WhQs



These results show that heritage speakers of Samoan deviate significantly from native speakers in their production of key ergative features in *wh*-questions, namely ergative case and the transitive suffix *–ina* (Table 4.5).

Table 4.5. Key Results from WhQ Production

	Native Speakers	Heritage Speakers
Ergative Case in O-WhQs	100%	0%
***-ina* in A-WhQs**	96.5%	4%

4.2.4.2 Discussion

The experiment on *wh*-questions reveals that heritage speakers do not mark the ergative case marker in *wh*-questions, nor the *–ina* suffix in the A-WHQs. Similar to the production of declarative constructions, without these key ergative features, heritage speakers here are producing ambiguous *wh*-questions. The ergative case marks the remaining argument in the embedded clause as an A argument, signaling the fact that it was an O argument that was extracted as the *wh*-word, and therefore an O-WhQ. In the same way, the transitive suffix *–ina* on the verb signals that an A argument was extracted as the *wh*-word, and therefore an A-WhQ. When these features do not occur, the transitive *wh*-question becomes ambiguous (4.13).

(4.13) No ergative case or *-ina*: O-WhQ or A-WhQ?

‘O ai ‘olo‘o si‘i le tama?

PRD who PROG lift the boy

‘Who is lifting the boy?’ or ‘Who is the boy lifting?’

However, unlike declaratives, word order in *wh*-questions cannot be used as a disambiguating cue, as the verb must intervene between the two arguments, otherwise the question would be completely ungrammatical. The *wh*-questions produced here by heritage speakers, then, are truly ambiguous. While there are no apparent signs of accusativity here, as seen in declaratives, it is clear that there is indeed a gap in the grammar of heritage speakers where ergativity is the essential element. The following section investigates these same issues in the production of relative clauses.

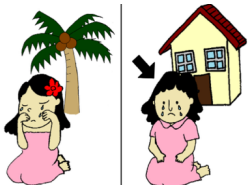
4.2.5 Relative Clause Production Task

The same Relative Clause Production Task used with native speakers in the previous chapter was administered again here with the heritage speakers. The purpose of this task was to investigate the production of the same two key ergative features in relative clauses, that is, the use of ergative case in O-RCs to mark the A argument within the relative clause (morphological), and the use of the transitive suffix *–ina* on the verb in A-RCs (syntactic).

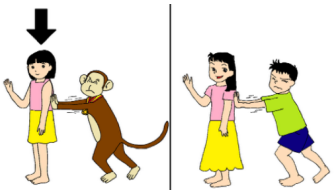
Participants were shown a series of pictures where they were prompted to produce a relative clause to describe the action depicted. There were a total of 15 items, 5 designed to elicit S-RCs, 5 to elicit O-RCs, and 5 to elicit A-RCs. An example of each item type is presented in Figure 4.8.

Figure 4.8. Sample of elicitation items from the Relative Clause Production Task

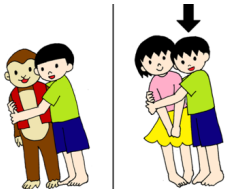
a) S-RC Item



b) O-RC Item



c) A-RC Item



All items depicted animate characters. The verbs elicited in this task are listed in Table 4.6. The full set of items can be seen in Appendix E.

Table 4.6. Elicited Verbs for Relative Clause Production Task

Intransitive Verbs			Transitive Verbs		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the item without the arrow. They were then given a short description of the actions depicted on each side of the picture (see table 4.10 below). After hearing the description, an arrow appeared on the screen pointing to one of the characters depicted in the picture. The participant was then asked by the researcher, "Who is the arrow pointing to?". The participant then responded by producing a relative clause. The S items were presented first, followed by the O items, and then the A items. An example of the protocol for each item is given in Table 4.7.

Table 4.7. Examples of Relative Clause Production Prompts

Type	Description	Prompt
S	*'Olo'o tagi le teine i luma o le niu.* PROG cry the girl in front of the coconut tree 'The girl is crying in front of the coconut tree.' *'Olo'o tagi le teine i luma o le fale.* PROG cry the girl in front of the house 'The girl is crying in front of the house.'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
O	*'Olo'o tūlei e le manukī le teine.* PROG push ERG the monkey the girl 'The monkey is pushing the girl.' *'Olo'o tūlei e le tama le teine.* PROG push ERG the boy the girl 'The boy is pushing the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
A	*'Olo'o fusi e le tama le manukī.* PROG hug ERG the boy the monkey 'The boy is hugging the monkey.' *'Olo'o fusi e le tama le teine.* PROG hug ERG the boy the girl 'The boy is hugging the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'

Based upon both the native speaker responses in the previous chapter, along with prescriptive descriptions of these constructions, we made the following predictions. For the S items, participants were expected to produce a relative clause with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb, along with an A argument marked by the ergative case marker. And finally, for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O

argument as the target structure. An example of each type of predicted response is presented in Table 4.8.

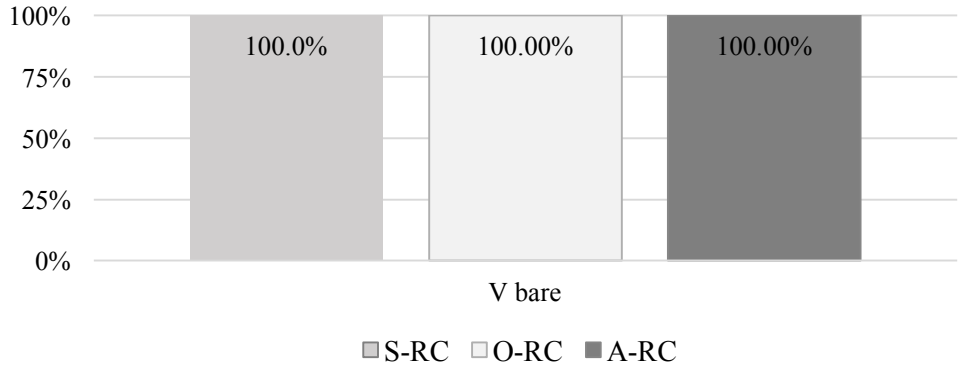
Table 4.8. Examples of Predicted Relative Clause Responses

Type	Predicted Participant Repsonse
S-Item	*le teine ʻoloʻo tagi i luma o le fale* the girl PROG cry in front of the house 'the girl that is crying in front of the house'
O-Item	*le teine ʻoloʻo tūlei e le manukī* the girl PROG push ERG the monkey 'the girl that the monkey is pushing'
A-Item	*le tama ʻoloʻo fusiina le teine* the boy PROG hug.*ina* the girl 'the boy that is hugging the girl.'

4.2.5.1 Results

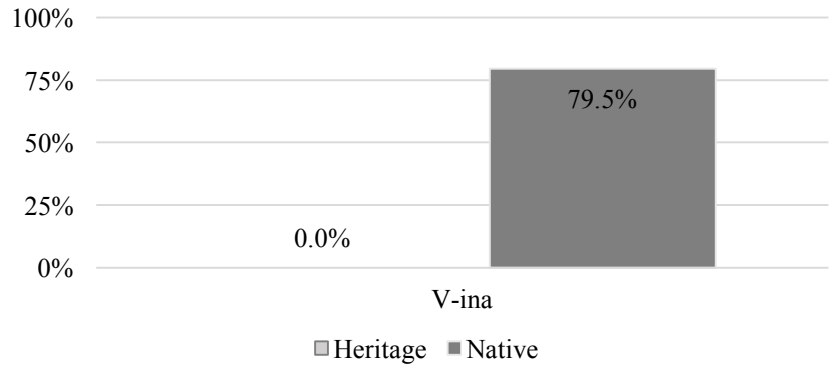
The results for the transitive suffix *–ina* are presented in Figure 4.9. All relative clauses were produced with bare verbs, including (crucially) A-RCs. From this we can say that heritage speakers do not appear to discriminate arguments along ergative lines in the production of relative clauses, revealing a clear lack of syntactic ergativity.

Figure 4.9. Heritage RC Production: Trans. Suffix *-ina*



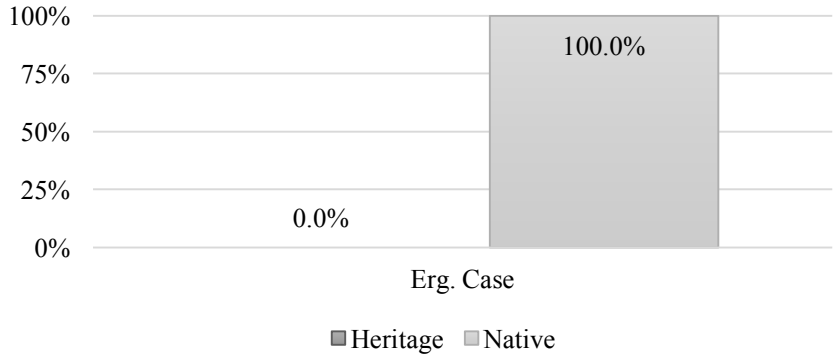
If these results are compared with what was observed with native speakers (Figure 4.10), the difference is stark. Native speakers used *–ina* in A-RCs in nearly four-fifths of their A-RCs, while heritage speakers produced not a single instance of *–ina*.

Figure 4.10. Heritage vs Native WhQ Production: A-RCs



An even more stark result is observed in the use of ergative case in O-RCs (Figure 4.11). Heritage speakers never produced the ergative case, while native speakers always did.

Figure 4.11. Heritage vs Native: Erg. Case O-RCs



The results observed here from relative clauses are in-line with what was observed with *wh*-questions, that is, heritage speakers show a consistent lack of both morphological and syntactic ergativity. A summary of results from both *wh*-questions and relative clauses is provided below (Table 4.9).

Table 4.9. Key Results from WhQ and Relative Clause Production Tasks

	Native Speakers	Heritage Speakers
Ergative Case in O-WhQs	100%	0%
***-ina* in A-WhQs**	96.5%	4%
Ergative Case in O-RCs	100%	0%
***-ina* in A-RCs**	79.5%	0%

4.2.5.2 Discussion

The lack of ergative features in relative clauses results in ambiguous constructions in the same way that was observed for both declaratives and *wh*-questions. Without the ergative case marker or the transitive suffix *–ina*, the transitive relative clause in (5) is ambiguous.

(4.14) No ergative case or *-ina*: A-RC or O-RC?

le teine [ʻoloʻo siʻi le tama]

the girl PROG lift the boy

'the girl that is lifting the boy' or 'the girl that the boy is lifting'

Relative clauses in Samoan, however, like *wh*-questions, do not allow for word order to be used to distinguish thematic roles, unlike declaratives. This is another vital gap in the grammar of heritage speakers left by the lack of ergative features. The following section investigates a final ergative feature (i.e. resumptive pronouns) to see if heritage speakers show any signs of ergativity in their grammar.

4.2.6 Relative Clause Resumptive Pronoun Judgement Task

As reported in the literature, resumptive pronouns can only occur in A-gaps, not S- and O-gaps (RCs, *Wh*-questions, Clefts). The purpose of this task was to investigate whether this syntactically ergative pattern could be observed in native speakers' grammaticality judgements of resumptive pronouns in relative clauses, that is, would participants accept A-RCs with resumptive pronouns, but reject S and O-RCs with resumptive pronouns?

To this end, participants were presented with a series of sentences and asked to rate the grammaticality of each sentence on a five point Likert scale. There were 6 test sentence types that were presented as a part of this task: each RC type (S, A, and O), with and without a resumptive pronoun. An example of each type can be seen in Table 4.10.

Table 4.10. Examples of Judgement Task Test Items

	Without Resumptive Prn	**With Resumptive Prn**
S	*le teine [ʻoloʻo ʻata]* the girl PROG laugh ʻthe girl that is laughing'	**le teine [ʻoloʻo ia ʻata]* the girl PROG 3S laugh ʻthe girl that is laughing'
O	*le teine [ʻoloʻo siʻi e le tama]* the girl PROG lift ERG the boy ʻthe girl that the boy is lifting'	**le teine [ʻoloʻo ia siʻi e le tama]* the girl PROG 3S lift ERG the boy ʻthe girl that the boy is lifting'
A	*le teine [ʻoloʻo tosoina le tama]* the girl PROG pull.*ina* the boy ʻthe girl that is pulling the boy'	*le teine [ʻoloʻo ia tosoina le tama]* the girl PROG 3S pull.*ina* the boy ʻthe girl that is pulling the boy'

There were four tokens of each type, for a total of 24 test items. Also included were 24 filler items. These consisted of three types of declarative sentences: canonical declaratives, quantified declaratives, and declaratives using clitic pronouns. These fillers were selected as controls to ensure the validity of the test item responses, as well as to obscure the target structures fom the participants themselves. Canoncial declaratives were chosen as the most basic items to ensure participants were sensitive to VS/VAO word order. Quantified declaratives were included as a slightly more complex, yet still fundamental, variation of canonical declaratives, where a numerical quantity occurred modifying a core argument. Finally, declaratives using clitic pronouns were included where participant responses would reveal sensitivity to core arguments occuring as clitic pronouns in constructions other than relative clauses. A grammatical and ungrammatical version of each type was included in the task. Each of these filler types were included as constructions without any direct involvement with ergativity. An example of each is presented in Table 4.11. With both test and filler items combined, the task consisted of a total of 48 items.

Table 4.11. Examples of Judgement Task Filler Items

	Grammatical	**Ungramamtical**
Cann.	*E poto tele le tama lea.* PRS smart very the boy this 'This boy is very smart.'	**'Ua pē le tuai ta'avale lea.* PRF die the old car this 'This old car has died.'
Quant.	*Sā va'ai le teine 'i le ta'avale e tasi.* PRS see the girl OBL the car PRS one 'The girl saw one car.'	**E mana'o le tama 'i tolu tusi.* PRS want the boy OBL three book 'The boy wants three books.'
Cl. Prn.	*'E te fiafia e faitau tusi.* 2S PRS like PRS read book 'You like to read books.'	**'Ua ia nofo i luga o le ta'avale.* PRF 3S sit on top of the car 'S/he has sat on top of the car.'

Test and filler items were presented together. The order in which they were presented was randomized using Excel. Items were read aloud individually to the participant. After each item was read, the participant rated the grammaticality of the sentence by circling the appropriate number on the judgement task form (see Appendix F).

4.2.6.1 Results

The results from the filler items from both the heritage and native speakers (reproduced from Chapter 3 for comparison) are presented in Table 4.12. The heritage speakers mirrored the native speakers in their scores for all of the filler items. These results suggest that i) heritage speakers demonstrate native-like performance when ergativity is not the crucial element, and ii) this task succesfully elicited accurate grammaticality results for each of these constructions.

Table 4.12. Judgement Task Results: Filler Items

	HERITAGE		NATIVE	
Declarative Type	**Mean Score**	**SD**	**Mean Score**	**SD**
Canonical	4.67	.88	4.68	.95
*Canonical	2.46	1.55	2.04	1.40
Quantified	4.22	1.34	4.14	1.32
*Quantified	2.68	1.62	2.06	1.33
Clitic Pronoun	4.51	1.09	4.07	1.34
*Clitic Pronoun	3.89	1.22	3.36	1.66

The results from the test items for both heritage and native speakers (reproduced from Chapter 3 for comparison) are presented in Table 4.13. Heritage speakers mirror native speakers in their rating of A-RCs both with and without the resumptive pronoun. Heritage speakers also show similarities with their native speaker counterparts in that they gave numerically lower ratings to O and S-RCs with resumptive pronouns than those without. However, unlike native speakers, the difference in heritage speaker ratings between S and O-RCs with and without resumptive pronouns are not statistically significant ($p > .05$), demonstrating a lack of ergativity in their judgement of relative clauses.

Table 4.13. Judgement Task Results: Test Items

	HERITAGE		NATIVE	
RC-Type	**Mean Score (SD)**	**Significance**	**Mean Score (SD)**	**Significance**
A-RC w/o prn	4.36 (1.16)		4.21 (1.32)	
A-RC w prn	4.22 (1.26)		4.14 (1.28)	
O-RC w/o prn	4.54 (1.00)		4.16 (1.33)	**
O-RC w prn	3.79 (1.38)		2.67 (1.67)	
S-RC w/o prn	4.51 (1.08)		4.24 (1.26)	**
S-RC w prn	3.63 (1.42)		2.99 (1.50)	

** $p<0.05$

4.2.6.2 Discussion

The data presented here show that heritage speakers fail to exhibit ergativity in their grammaticality judgements, and they fall short of native-like performance. While there was a numerical tendency in the direction of an ergative pattern, that difference was not statistically significant. This is consistent with the results found in the production tasks as well.

4.2.7 General Discussion

The series of elicitation tasks presented in this chapter reveal a substantial gap in ergativity in the grammar of heritage speakers. In terms of morphological ergativity, a complete lack of ergative case marking (0%) was observed in the production of declaratives, relative clauses, and *wh*-questions. This deviated considerably from native speakers who always produced ergative case (100%). The absence of the ergative case marker resulted in heritage speakers production consitently producing ambigous constructions, that is, the thematic roles were not clearly assigned. It is clear here that heritage speakers show a lack of morphological ergativity.

A similar result was seen in the production of syntactic ergativity. The transitive suffix *–ina* was never produced in relative clauses (0%). However, there were faint signs of the suffix in *wh*-questions (4%). This clearly constrasts with the results observed with native speakers. However, the difference in heritage results between relative clauses and *wh*-questions mirrors that of native speakers, in that *–ina* was produced at a lower rate in relative clauses (79.5%) than *wh*-questions (96.5%). This again suggests that although these two structures are similar superficially, underlying they are indeed distinct, a fact apparent in both heritage and native speakers.

Heritage speakers also showed weak signs of syntactic ergativity in their grammaticality judgements of resumptive pronouns in relative clauses, falling short of native-like use in that they were shown to be statistically insignifcant. It is clear then that there is indeed a lack of syntactic ergativity in the grammar of heritage speakers.

Heritage speakers, then, lack both morphological and syntactic ergavitity, leaving a substantial gap in their grammar. The following chapter presents a subsequent study that investigated whether this gap in heritage grammar could be filled by recovering these key morphological and syntavtic ergative features.

Chapter 5. Experiment 3: An Ergative Intervention in Heritage Samoan

The previous chapter demonstrated that key ergative features are conspicuously lacking in the grammar of heritage speakers. This absence of ergativity leaves a considerable gap, resulting in irreconcilable ambiguity accross a plethora of syntactic structures. The vital question then becomes, can specific recourse be taken to fill this crucial gap in heritage grammar? This chapter reports on a study showing that this indeed can be done. Key ergative features, both morphological and syntactic, can be recovered through carefully targeted, linguistic intervention.

While no study has looked specifically at Samoan or ergativity in this regard, previous intervention studies targeting other linguistic phenomena have demonstrated success in generating grammatical knowledge that was initially shown to be lacking. Song et al. (1997) showed that heritage speakers of Korean who were initially deficient in the use of nominative and accusative case markers, significantly improved in both comprehension of these features after targeted intervention, in this case, explicit instruction. Korean exhibits relatively free word order (i.e. SOV or OSV) enabled by the accusative case marking system. A picture selction task revelaed that although heritage speakers of Korean were shown to have correctly interpretted SOV sentences (94%), they demonstrated noticeable difficulty with OSV sentences, correctly interpretting these sentences only 25% of the time. However, participants were then take through two intervention sessions where the case system in Korean was explained with examples of both SOV and OSV patterns, followed by interactive demonstrations using props where participants were given immediate feedback as to the correct interpretation of key sentences. Upon completion of the intervention training, the participants were again given the picture selection task where the correct interpretations of OSV sentences increased to a rate of 66%. SOV sentences mainted a high rate of correct interpretation at 96%. This study demonstrates that recovery of key ergative features in heritage grammar is achievable.

Related studies looking at heritage speakers of Spanish showed similar results in the use of dative case, as well as subjunctive mood (Montrul & Bowles 2008, Potowski et al. 2009). Montrul & Bowles (2008) observed that heritage speakers of Spanish exhibit incomplete knowledge of dative case marking, however, following instructional treatment consisting of explicit grammatical explanations followed by three practice excercises, heritage speakers demonstrated significant gains in both intuition and production. Potowski et al. (2009) conducted a similar study investigating the deficiency of subjunctive mood in heritage Spanish.

They too found significant improvement in both interpretation and production of the subjunctive mood following targeted intervention (e.g. explicit instruction).

The current study seeks to investigate the possibility of comparable results in heritage Samoan, that is, a significant improvement in the use of ergative features by heritage speakers after exposure to targeted linguistic intervention.

5.1 Overview of Intervention

Participants were taken through a series of elicitation tasks arranged in five separate stages: i) pre-test, ii) intervention, iii) immediate post-test, iv) delayed post-test, and v) extension test. The pre-test was administered to measure initial rates of ergative features in select constructions (i.e. declaratives, *wh*-questions, and relative clauses). An intervention was then given, where participants were trained in key ergative features (e.g. ergative case, transitive suffix *-ina*). Participants were then given an immediate post-test to measure any increase in ergative features. After a two to three week interval, participants were administered a delayed post-test, followed by an extension test to see if: i) any ergative features recovered had been maintained, and ii) if these features would be extended to constructions not included in the intervention. A summary of the elicitation timeline is presented in Table 5.1.

Table 5.1. Timeline of Elicitation Sessions (Heritage)

SESSION I:			**SESSION II:**	
		(2 – 3 wk Interval)		
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives	Control -- None	Declaratives	Declaratives	Relative Clauses
Wh-Questions	Morph. -- Declarative	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses	Synt. -- Wh-Questions			
Resmpt. Prns.				

The specific research questions addressed in this study are detailed in the following sections, as well as the design, method, results, and implications of these findings, namely, the extent, durability, and breadth of the recoverability of ergative features in heritage grammar.

5.2 Research Questions

Four interdependent research questions addressing specific aspects of recovering ergativity in heritage Samoan were the focus of the current study. Each are discussed in detail here.

1. Can the ergative features initially found lacking in heritage grammar be recovered through careful linguistic intervention? The absence of ergativity in heritage Samoan creates a vacuum of ambiguity in many fundamental grammatical constructions (e.g. relative clauses, *wh*-questions), even as basic as transitive declaratives. Is this crucial gap in syntactic knowledge permanent, or can it be filled through a targeted intervention where heritage speakers are trained in the use of key ergative features?

2. If key ergative features are indeed recoverable through targeted intervention, how durable would these recovered features be? Would the intervention have a superficial effect that lasts only a few days, or would any improvement in ergativity represent a more durable, long-lasting change, perhaps indicative of a more permanent change in grammar?

3. If the recovery does demonstrate a durable change in grammar, to what extent has the grammar been affected? Are the recovered ergative features specific to individual constructions, or have they been generalized as an underlying pattern of ergativity across a range of both morphological and syntactic structures, suggesting a change in underlying grammar?

4. If an underlying pattern of ergativity has indeed been recovered, can any differences be observed between the effects of intervention targeting morphological versus syntactic features? That is, which type of ergative cues might generate a more robust recovery, syntactic or morphological? Typologically speaking, there are many languages with morphological ergativity without syntactic ergativity; however, no languages exhibit syntactic ergativity without morphological ergativity (Dixon 1979). Given this typological universal in the directionality of ergativity, would syntactic intervention result in a higher rate of recovered ergative features as opposed to vice versa? Put another way, can the full spectrum of ergativity (i.e. morphological and syntactic) be recovered given only syntactic cues?

Each of these questions were empirically investigated. The design, method, and results of each stage are presented in the following sections.

5.3 Heritage Intervention

This section presents the experiments much like those described in earlier chapters that address the research questions laid out in the previous section, that is, the extent to which ergative features can be recovered in heritage Samoan through targeted linguistic intervention.

5.3.1 Participants

The same 45 heritage speakers that participated in the study presented in the previous chapter also participated in the current study that was conducted immediately following the first. For the purposes of this study, however, they were split randomly into three separate groups of 15. Each group received a different type of intervention, described in the next section. The first was a control group (i.e. no intervention), the second a morphological group (i.e. declarative intervention), and the third a syntactic group (i.e. *wh*-question intervention). A complete list of participant groups can be found in Appendix G.

5.3.2 Materials and Design

The same 4 tasks used in the previous chapters were again employed here: 1) Declarative Sentence Completion Task, 2) *Wh*-Question Production Task, 3) Relative Clause Production Task, and 4) Resumptive Pronoun Judgement Task. Each of these tasks were administered in the same way as the previous studies.

In addition, two types of intervention tasks were also introduced. One focused on morphological ergativity: 5) Declarative Intervention Task, while the other focused on syntactic ergativity: 6) *Wh*-Question Intervention Task. The goal of these tasks was to create linguistic contexts that highlighted key ergative features to train participants on their appropriate use. Two techniques were chosen to achieve this. The first was explicit modeling. This technique involved presenting a picture to the participant where the researcher modeled the appropriate description of the item with key ergative features included. The second technique was recasting. For this technique, the participant was taken through the elicitation task where they were prompted to produce a description of each of item. If the participant failed to produce an

ergative feature, the researcher would recast the appropriate description with prosodic emphasis on the key ergative feature previously missed. The participant was then asked to imitate this recast with the necessary elements.

The tasks were divided into five stages: i) pretest, ii) intervention, iii) post-test, iv) delayed post-test, and v) extention test. A full description of each stage and the tasks therein are given in the following sections.

5.3.2.1 Pretests

Participants were first administered a series of pretests to establish a baseline of ergativity from which any increase following the intervention could be measured. This initial stage consisted of the four core elicitation tasks used in previous chapters: 1) declarative production, 2) *wh*-question production, 3) relative clause production, and 4) resumptive pronoun grammaticality judgement.

Table 5.2. Session I: Pretests

1) Declarative Sentence Completion Task
2) Wh-Question Production Task
3) Relative Clause Production Task
4) Resumptive Pronoun Judgement Task

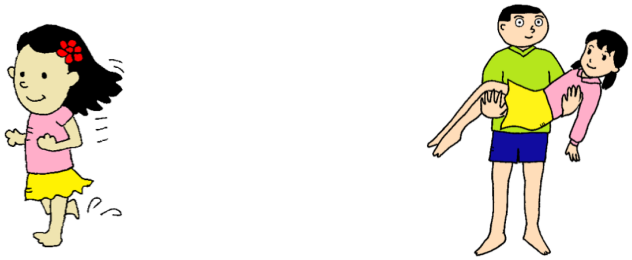
Each was presented to the participant in the order displayed in Table 5.2, and each are described in detail below.

5.3.2.1.1 Declarative Sentence Completion Task – Materials and Procedure

This was the exact same task presented in previous chapters. The purpose was to measure the rate at which participants produce ergative case marking in declarative sentences (i.e. marking A arguments with *e*, while leaving S and O arguments unmarked). Participants were presented 10 test items (5 intransitive, 5 transitive) for which they were tasked with producing a declarative sentence describing each. An example of the two item types is presented in Figure 5.1.

Figure 5.1. Sample of intransitive and transitive pictures

a) Intransitive Item b) Transitive Item



All items depicted animate characters. A list of the verbs used are listed in Table 5.3. The full set of items can be seen in Appendix C.

Table 5.3. Elicited Verbs for Declarative Completion Task

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant on a laptop screen. Participants were given the first portion of a declarative sentence by the researcher, in this case,

the verb (i.e. TAM and verb). They were then tasked with completing the sentence, essentially producing the appropriate arguments of the verb as they pertained to the picture. The 5 intransitive items were presented first, followed by the 5 transitive items.

An example of the protocol for the transitive item presented in Fig 5.2(b) is given here. The participant was first shown the picture on the laptop screen. The researcher then prompted the participant with the first portion of the sentence, in this case the verb: *ʻolo ʻo siʻi* ʻPROG liftʼ. The participant then completed the sentence by producing the two arguments with the appropriate case marking, in this case, the A argument, *e le tama* ʻERG the boyʼ, and the O argument, *le teine* ʻthe girlʼ (5.1).

(5.1) Researcher Prompt: Expected Participant Response:

ʻOlo ʻo siʻi... *e le tama le teine.*

PROG lift ERG the boy the girl

ʻThe boy is lifting the girl.ʼ

5.3.2.1.2 *Wh*-Question Production Task – Materials and Procedure

Immediately following the declarative production task, participants were given the *Wh*-Production Task (same protocol as in previous chapters). The purpose of this task was to investigate the production of two key ergative features in *wh*-questions, one morphological and the other syntactic. The first feature was the use of ergative case in O-WhQs to mark the A argument in the embedded clause (morphological, 5.2). The second feature was the use of the transitive suffix *–ina* in A-WhQs (syntactic, 5.3).

(5.2) O-WhQ (Ergative Case):

ʻO ai ʻolo ʻo siʻi e le tama?

PRD who PROG lift ERG the boy

ʻWho is the boy lifting?ʼ

(5.3) A-WhQ (Transitive Suffix *–ina*):

ʻO ai ʻolo ʻo siʻiina le teine?

PRD who PROG lift.*ina* the girl

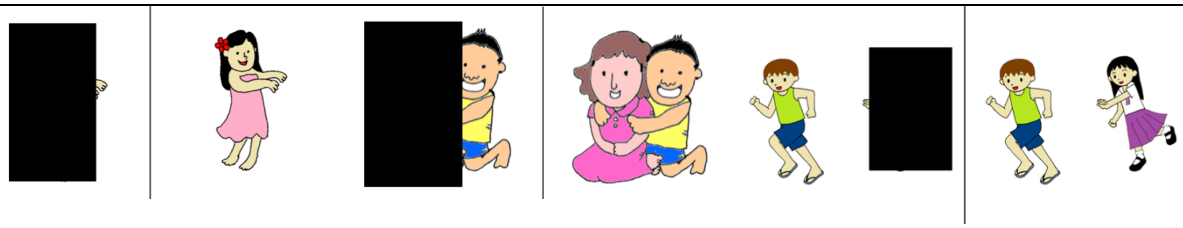
ʻWho is lifting the boy?ʼ

Participants were shown a series of pictures where they were prompted to produce a *wh*-question as it pertained to the action depicted. There were a total of 15 items, 5 designed to elicit

S-WhQs, 5 to elicit O-WhQs, and 5 to elicit A-WhQs. An example of each item type is presented in Figure 5.2.

Figure 5.2. Sample of elicitation items from the *Wh*-Question Production Task

a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item



All items depicted animate characters. A list of the verbs used are listed in Table 5.4. The full set of items can be seen in Appendix D.

Table 5.4. Elicited Verbs for *Wh*-Question Production Task.

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the

participants the following prompt (in Samoan) to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 5.5. The S items were presented first, followed by the O items, and then the A items.

Table 5.5. Examples of *Wh*-Question Prompts

No.	Type	Prompt
(a)	S-WhQ Item:	*'Olo'o siva se isi. Fesili mai po 'o ai.* PROG dance a other ask DIR PRT PRD who 'Someone is dancing. Ask me who.'
(b)	O-WhQ Item:	*'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.* PROG hug ERG the boy a other ask DIR PRT PRD who 'The boy is hugging someone. Ask me who.'
(c)	A-WhQ Item:	*'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.* PROG pull ERG a other the boy ask DIR PRT PRD who 'Someone is chasing the boy. Ask me who.'

For the S items, participants were expected to produce a *wh*-question with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb in the embedded clause along with the remaining A argument marked by the ergative case. And finally for the A items, they were expected to produce the transitive suffix –*ina* on the verb with an unmarked O argument in the embedded clause as the target structure. An example of each is given in Table 5.6.

Table 5.6. Examples of Predicted *Wh*-Question Responses

No.	Type	Predicted Participant Repsonse
(a)	S-WhQ Item	*‘O ai ‘olo‘o siva?* PRD who PROG run ‘Who is dancing?’
(b)	O-WhQ Item	*‘O ai ‘olo‘o fusi e le tama?* PRD who PROG hug ERG the boy ‘Who is the boy hugging?’
(c)	A-WhQ Item	*‘O ai ‘olo‘o tuliina le tama?* PRD who PROG chase.*ina* the boy ‘Who is chasing the boy?’

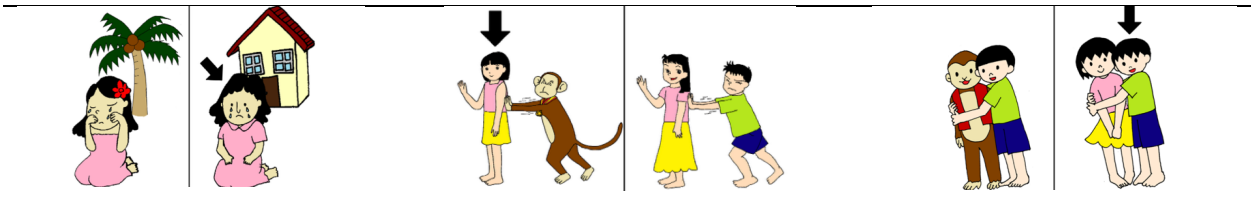
5.3.2.1.3 Relative Clause Production Task – Materials and Procedure

Following the *wh*-question production task, the participant was then presented with the Relative Clause Production Task (same as previous chapters). The purpose of this task was to investigate the production of the same two key ergative features in relative clauses, that is, the use of ergative case in O-RCs to mark the A argument within the relative clause (morphological), and the use of the transitive suffix *–ina* on the verb in A-RCs (syntactic).

Participants were shown a series of pictures where they were prompted to produce a relative clause to describe the action depicted. There were a total of 15 items, 5 designed to elicit S-RCs, 5 to elicit O-RCs, and 5 to elicit A-RCs. An example of each item type is presented in Figure 5.3.

Figure 5.3. Sample of elicitation items from the Relative Clause Production Task

a) S-RC Item b) O-RC Item c) A-RC Item



All items depicted animate characters. The verbs elicited in this task are listed in Table 5.7. The full set of items can be seen in Appendix E.

Table 5.7. Elicited Verbs for Relative Clause Production Task.

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the item without the arrow. They were then given a short description of the actions depicted on each side of the picture (see table 5.7 below). After hearing the description, an arrow appeared on the screen pointing to one of the characters depicted in the picture. The participant was then asked by the researcher, "Who is the arrow pointing to?". The participant then responded by producing a relative clause. The S items were presented first, followed by the O items, and then the A items. An example of the protocol for each item is given in Table 5.8.

Table 5.8. Examples of Relative Clause Production Prompts

Type	Description	Prompt
S	*'Olo'o tagi le teine i luma o le niu.* PROG cry the girl in front of the coconut tree 'The girl is crying in front of the coconut tree.' *'Olo'o tagi le teine i luma o le fale.* PROG cry the girl in front of the house 'The girl is crying in front of the house.'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
O	*'Olo'o tūlei e le manukī le teine.* PROG push ERG the monkey the girl 'The monkey is pushing the girl.' *'Olo'o tūlei e le tama le teine.* PROG push ERG the boy the girl 'The boy is pushing the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
A	*'Olo'o fusi e le tama le manukī.* PROG hug ERG the boy the monkey 'The boy is hugging the monkey.' *'Olo'o fusi e le tama le teine.* PROG hug ERG the boy the girl 'The boy is hugging the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'

Based upon both the native speaker responses in the previous chapter, along with prescriptive descriptions of these constructions, we made the following predictions. For the S items, participants were expected to produce a relative clause with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb, along with an A argument marked by the ergative case marker. And finally, for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O

argument as the target structure. An example of each type of predicted response is presented in Table 5.9.

Table 5.9. Examples of Predicted Relative Clause Responses

Type	**Predicted Participant Repsonse**
S-Item	*le teine ʻoloʻo tagi i luma o le fale* the girl PROG cry in front of the house 'the girl that is crying in front of the house'
O-Item	*le teine ʻoloʻo tūlei e le manukī* the girl PROG push ERG the monkey 'the girl that the monkey is pushing'
A-Item	*le tama ʻoloʻo fusiina le teine* the boy PROG hug.*ina* the girl 'the boy that is hugging the girl.'

5.3.2.1.4 Relative Clause Resumptive Pronoun Judgement Task – Materials and Procedure

The final task of the pretest was the Relative Clause Resumptive Pronoun Judgement Task. The purpose of this task was to investigate whether this syntactically ergative pattern could be observed in native speakers' grammaticality judgements of resumptive pronouns in relative clauses, that is, would participants accept A-RCs with resumptive pronouns, but reject S and O-RCs with resumptive pronouns?

To this end, participants were presented with a series of sentences and asked to rate the grammaticality of each sentence on a five point Likert scale. There were 6 test sentence types that were presented as a part of this task: each RC type (S, A, and O), with and without a resumptive pronoun. An example of each type can be seen in Table 5.10.

Table 5.10. Examples of Judgement Task Test Items

	Without Resumptive Prn	**With Resumptive Prn**
S	*le teine [ʻoloʻo ʻata]* the girl PROG laugh ʻthe girl that is laughing'	**le teine [ʻoloʻo ia ʻata]* the girl PROG 3S laugh ʻthe girl that is laughing'
O	*le teine [ʻoloʻo siʻi e le tama]* the girl PROG lift ERG the boy ʻthe girl that the boy is lifting'	**le teine [ʻoloʻo ia siʻi e le tama]* the girl PROG 3S lift ERG the boy ʻthe girl that the boy is lifting'
A	*le teine [ʻoloʻo tosoina le tama]* the girl PROG pull.*ina* the boy ʻthe girl that is pulling the boy'	*le teine [ʻoloʻo ia tosoina le tama]* the girl PROG 3S pull.*ina* the boy ʻthe girl that is pulling the boy'

There were four tokens of each type, for a total of 24 test items. Also included were 24 filler items. These consisted of three types of declarative sentences: canonical declaratives, quantified declaratives, and declaratives using clitic pronouns. These fillers were selected as controls to ensure the validity of the test item responses, as well as to obscure the target structures fom the participants themselves. Canoncial declaratives were chosen as the most basic items to ensure participants were sensitive to VS/VAO word order. Quantified declaratives were included as a slightly more complex, yet still fundamental, variation of canonical declaratives, where a numerical quantity occurred modifying a core argument. Finally, declaratives using clitic pronouns were included where participant responses would reveal sensitivity to core arguments occuring as clitic pronouns in constructions other than relative clauses. A grammatical and ungrammatical version of each type was included in the task. Each of these filler types were included as constructions without any direct involvement with ergativity. An example of each is presented in Table 5.11. With both test and filler items combined, the task consisted of a total of 48 items.

Table 5.11. Examples of Judgement Task Filler Items

	Grammatical	**Ungramamtical**
Cann.	*E poto tele le tama lea.* PRS smart very the boy this 'This boy is very smart.'	**'Ua pē le tuai ta'avale lea.* PRF die the old car this 'This old car has died.'
Quant.	*Sā va'ai le teine 'i le ta'avale e tasi.* PRS see the girl OBL the car PRS one 'The girl saw one car.'	**E mana'o le tama 'i tolu tusi.* PRS want the boy OBL three book 'The boy wants three books.'
Cl. Prn.	*'E te fiafia e faitau tusi.* 2S PRS like PRS read book 'You like to read books.'	**'Ua ia nofo i luga o le ta'avale.* PRF 3S sit on top of the car 'S/he has sat on top of the car.'

Test and filler items were presented together. The order in which they were presented was randomized using Excel. Items were read aloud individually to the participant. After each item was read, the participant rated the grammaticality of the sentence by circling the appropriate number on the judgement task form.

5.3.2.2 Intervention Tasks

Following the pretests, all participants, except for those in the control group who did not receive any intervention, were taken through one of two intervention tasks. Those participants in the morphological group were given Task 1: Declarative Intervention, while those in the syntactic group were given Task 2: *Wh*-Question Intervention (Table 5.12).

Table 5.12. Session I: Intervention

Control Group: None
Morphological Group: Declarative Intervention Task
Syntactic Group: *Wh*-Question Intervention

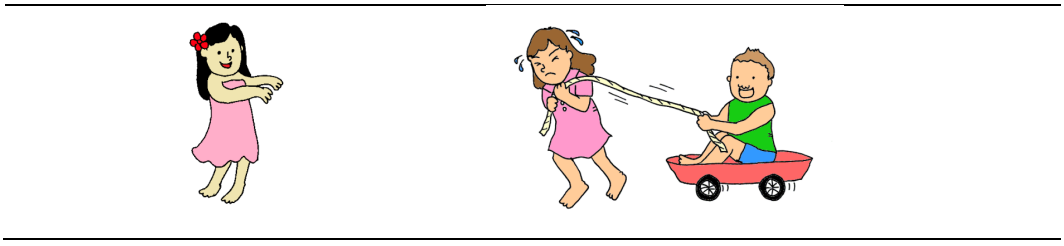
Both intervention tasks are detailed in the following sections.

5.3.2.2.1 Task 1: Declarative Intervention

The Declarative Intervention Task was structured in the same way as the Declarative Production Task with explicit intervention by the researcher to ensure the production of the morphological ergativity in order to train the participant on the appropriate use of the ergative case. There were a total of 5 intransitive items, and 5 transitive items. An example of each is presented in Figure 5.4.

Figure 5.4. Sample of intransitive and transitive pictures for intervention

a) Intransitive Item b) Transitive Item



All items depicted animate characters. A total of 5 intransitive verbs were used (*siva* 'dance', *oso* 'jump', *pa'ū* 'fall', *tamo'e* 'run', *tū* 'stand'), along with 5 transitive verbs (*toso* 'pull', *si'i* 'lift', *fa'asusū* 'spray', *kiki* 'kick', *fusi* 'hug'). The full set of items can be seen in Appendix C.

The task began with explicit modeling of declarative sentences by the researcher to the participant. The participant was presented with an intransitive item first. The researcher then modeled the appropriate description of that item by producing an intransitive declarative sentence (i.e. VS with no ergative case marker). The participant was then shown a transitive item. The researcher again modeled the appropriate description of the item by producing a transitive declarative sentence with the necessary ergative features (i.e. VAO with the ergative case marker). The protocol for this intervention technique is presented in Table 5.13. The prompts were given in English, and the modeled response was given in Samoan.

Table 5.13. Declarative Intervention Protocol: Explicit Modeling

(a) *-- The particiant is shown an intransitive item. --*

Reasearcher: To describe this item, you would say,

"*'Olo'o siva le teine.*"
PROG dance the girl
'The girl is dancing.'

(b) *-- The particiant is then shown a transitive item. --*

Reasearcher: To describe this item, you would say,

"*'Olo'o toso e le teine le tama.*"
PROG pull ERG the girl the boy
'The girl is pulling the boy.'

Following the explicit modeling, the participant was then taken through each task item. In the same way as the Declarative Production Task, participants were given the first portion of a declarative sentence by the researcher (i.e. TAM and verb). They were then tasked with completing the sentence (i.e. verbal arguments). The intransitive items were presented first, followed by the transitive items. If the participant produced the description of the item without the appropriate ergative features (i.e. ergative case), the researcher would then recast the description with prosodic emphasis on the previously missed ergative feature. The participant was then asked to imitate the researcher's recast. An example of the protocol for the transitive item presented in Figure 5.4(b) is given here in Table 5.14 (R: Researcher, P: Participant).

Table 5.14. Declarative Intervention Protocol: Recast

-- The particiant is shown the transitive item. Researcher prompts, participant responds. --

	'Olo'o toso...	*'Olo'o toso le teine le tama.*
R:	PROG pull	P: PROG pull the girl the boy
	'Pulling...'	*'The girl is pulling the boy.'

-- The researcher recasts with ergative case. The participant imitates recast. --

	'Olo'o toso ***e*** *le teine le tama.*	*'Olo'o toso* ***e*** *le teine le tama.*
R:	PROG pull **ERG** the girl the boy	P: PROG pull **ERG** the girl the boy
	'The girl is pulling the boy.'	'The girl is pulling the boy.'

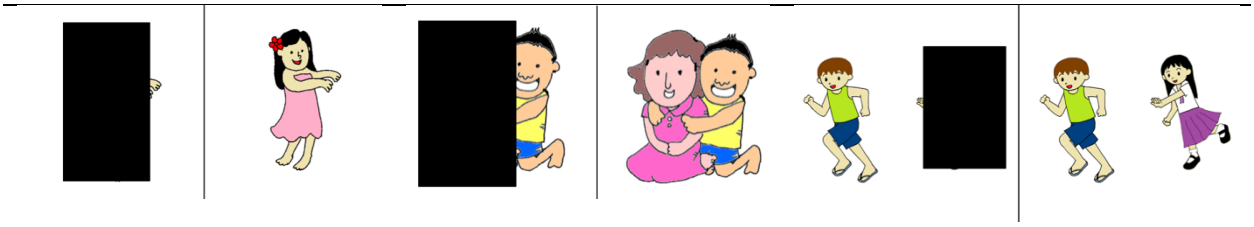
Through the use of both explicit modeling and recasting, the objective was for the participant to be aware of morphological ergativity (i.e. case) and its use in transitive declarative sentences, to utlimately produce ergative case in declarative sentences without any need for assistance. This task was only administered to the participants in the morphological group.

5.3.2.2.2 Task 2: *Wh*-Question Intervention Task

The *Wh*-Question Intervention Task was the second of the intervention tasks, and it was structured in the same way as the *Wh*-Question Production Task with an additional intervention component to ensure the production of syntactic ergativity in order to train the participant on the appropriate use of the transitive suffix *–ina*, as well as the ergative case marker in *wh*-questions. There were a total of 5 S-WhQ items, 5 O-WhQ items, and 5 A-WhQ items. An example of each is presented in Figure 5.5.

Figure 5.5. Sample items from the *Wh*-Question Production Task

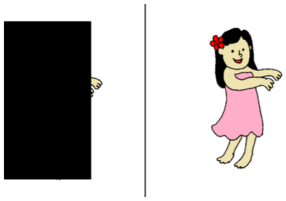
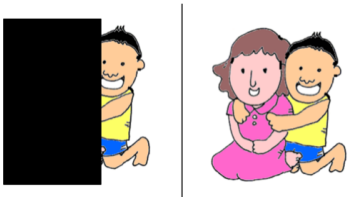
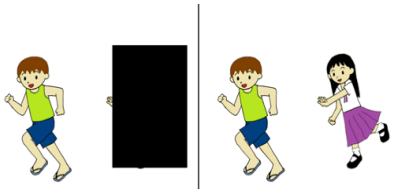
a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item



All items depicted animate characters. A total of 5 intransitive verbs were used for the S-items (*tagi* 'cry', *tamo'e* 'run', *'ata* 'laugh', *nofo* 'sit', *tā'ele* 'bathe'), along with 10 transitive verbs for the O and A items, respectively (O: *'ini* 'pinch', *tāofi* 'stop', *'otegia* 'scold', *tūlei* 'push', *lagona* 'hear'; A: *si'i* 'lift', *tūlei* 'push', *fa'asusū* 'spray', *fusi* 'hug', *tuli* 'chase'). The full set of items can be seen in Appendix D.

The task began with explicit modeling. As in declarative intervention, the participant was shown an example of each item type (S, O, and A). The researcher then modeled the appropriate description for each item with the relevant ertative features. The protocol for this portion of the task is presented in Table 5.15.

Table 5.15. *Wh*-Question Intervention Protocol: Explicit Modeling

(a)	*-- The particiant is shown an S-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*'O ai 'olo'o siva?* PRD who PROG dance 'Who is dancing?'	
(b)	*-- The particiant is then shown an O-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*'O ai 'olo'o fusi e le tama?"* PRD who PROG hug ERG the boy 'Who is the boy hugging?'	
(c)	*-- The particiant is then shown an A-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*'O ai 'olo'o tuliina le tama?"* PRD who PROG chase.*ina* the boy 'Who is chasing the boy?'	

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the participants the following prompt to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 5.15. The S items were presented first, followed by the O items, and then the A items.

Following the explicit modeling, the participant was then taken through each task item. In the same way as the *Wh*-Question Production Task, participants were first the item with a portion of the picture blocked out by a black rectangle. They were then told, "Someone is doing something, ask me who." The participant would then respond with a *wh*-question. The S-WhQ items were presented first, followed by the O-WhQ and the A-WhQ items. If the participants produced a *wh*-questions without the appropriate ergative features (i.e. *–ina,* ergative case), the researcher would then recast the question with prosodic emphasis on the previously missed

feature. The participant was then asked to imitate the researcher's recast. An example of the protocol for the O and A items are presented in Table 5.16 (R: Researcher, P: Participant).

Table 5.16. *Wh*-Question Intervention Protocol: Recast

(a) *-- The particiant is shown an O-WhQ item. Researcher prompts, participant responds. --*

'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.

R: PROG hug ERG the boy a other ask DIR PRT PRD who

'The boy is hugging someone. Ask me who.'

'O ai 'olo'o fusi le tama?"

P: PRD who PROG hug the boy

*'Who is the boy hugging?'

-- The researcher recasts with ergative case. The participant imitates recast. --

*'O ai 'olo'o fusi **e** le tama?"*

R: PRD who PROG hug **ERG** the boy

'Who is the boy hugging?'

*'O ai 'olo'o fusi **e** le tama?"*

P: PRD who PROG hug **ERG** the boy

'Who is the boy hugging?'

(b) *-- The particiant is shown an A-WhQ item. Researcher prompts, participant responds. --*

'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.

R: PROG pull ERG a other the boy ask DIR PRT PRD who

'Someone is chasing the boy. Ask me who.'

'O ai 'olo'o tuli le tama?"

P: PRD who PROG chase the boy

*'Who is chasing the boy?'

-- The researcher recasts with ergative case. The participant imitates recast. --

*'O ai 'olo'o tuli**ina** le tama?"*

R: PRD who PROG hug.**ina** the boy

'Who is the boy hugging?'

*'O ai 'olo'o tuli**ina** le tama?"*

P: PRD who PROG hug.**ina** the boy

'Who is the boy hugging?'

The objective of explicit modeling and recasting in this task was to make the participant aware of syntactic ergativity (i.e. transitive suffix *-ina*) and its use in *wh*-questions with the ultimate goal of participants producing these ergative features without need for intervention. This task was only administered to the participants in the syntactic group.

5.3.2.3 Post-Tests: Declarative and *Wh*-Question Production

Following the intervention task, all participants were taken through two post-tests. The purpose of these post-tests was to measure any increase from the pretest in the use of ergative features as an effect of the intervention. The post-tests consisted of two of the same tasks adminstered in the pretest, but with different items. The first was the Declarative Sentence Completion Task and the second was the *Wh*-Question Production Task (Table 5.17).

Table 5.17. Session I: Immediate Post-test

1) Declarative Sentence Completion Task
2) Wh-Question Production Task

Participants were taken through these tasks twice, once immediately following the intervention in the Immediate Post-test to measure any initial increase in ergativity, and again two to three weeks later in the Delayed Post-test to see whether any initial increase had been maintained (Table 5.18).

Table 5.18. Session II: Delayed Post-test (2 – 3wks later)

1) Declarative Sentence Completion Task
2) Wh-Question Production Task

Each time the task was administered new items were used.

5.3.2.4 Extension Tests: Relative Clause Production and Resumptive Pronoun Judgement

After participants completed the post-tests, they were then taken through two extenstion tests. These were again two of the same tasks given in the pretest, however, for these constructions, the participants were not given any form of intervention. The purpose of these tasks, then, was to investigate whether participants might extend the use of ergative features beyond the constructions given in the intervention. This would indicate a more general pattern of ergativity.

The first task given as a part of the extension test was the Relative Clause Production Task. This was the same task from the pretest with new items. The second task was the Resumptive Pronoun Judgement Task. Again, this was the same used from the pretest, however, with all new items (Table 5.19).

Table 5.19. Session II: Extenstion Test

1) Relative Clause Production Task
2) Resumptive Pronoun Judgement Task

This concluded the elicitation sessions.

5.3.3 Procedure

As outlined in the previous sections, all six elicitation tasks were strategically organized to address each of the research questions. Elicitation took place over the course of two separate sessions. Each session was divided into specific units, each consisting of a particular set of eliciation tasks. In Session I, participants were first taken through a series of pretests. This consisted of Declarative Production, Wh-Question Production, Relative Clause Production, and Resumptive Pronoun Judgement. Following the pretests, participants were taken through an intervention task. The type of intervention participants received depended upon their participant group. Of the 45 total participants, 15 were given no intervention at all as the control group, 15 were given the Delcarative Intervention Task as the morphological group, and 15 were given the *Wh*-Question Intervention Task as the syntactic group. Upon completion of the intervention, all participants were given an immediate post-test, which consisted of both the Declarative

Production and *Wh*-Question Production Tasks. These were the same tasks as before with different items. This concluded Session I.

Session II took place 2 – 3 weeks after Session I. In this session, participants were taken through a delayed post-test, which consisted again of Declarative and *Wh*-Question Production tasks with different items from before. Following the delayed post-test, participants were given an extension test. This consisted of a Relative Clause Production Task and a Resumptive Pronoun Judgement Task, again same tasks as the pretest, but with different items. This concluded Session II.

The full breakdown of the timeline for both sessions, as well as the elicitation tasks contained within and participant group, is presented in the following tables. Table 5.20 presents the order of tasks for the control group.

Table 5.20. Timeline of Elicitation Sessions: *Control Group*

SESSION I:			(2 – 3 wk Interval) **SESSION II:**	
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	NONE	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

Table 5.21 and Table 5.22 present the timeline for the morphological and syntactic groups, respectively.

Table 5.21. Timeline of Elicitation Sessions: *Morphological Group*

SESSION I:			**SESSION II:** (2 – 3 wk Interval)	
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	DECLARATIVES	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

Table 5.22. Timeline of Elicitation Sessions: *Syntactic Group*

SESSION I:			**SESSION II:** (2 – 3 wk Interval)	
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	WH-QUESTIONS	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

5.3.4 Predictions

In the prestest, participants were expected to produce a minimum of ergative features across all elicitation tasks. In fact, this was already observed in the previous chapter. However, the remaining tests seek to address the four research questions previsouly laid out in section 5.2.

1. Can the ergative features initially found lacking in heritage grammar be recovered through careful linguistic intervention? If the intervention has any effect, there should be a significant increase in the production of ergative features in the immediate post-test, which addresses the first question of whether ergative features can be recovered. However, the degree of recovery should depend heavily on the type of intervention the participant received.

Morphological Intervention Group: For those in the morphological group, which focused on declarative production, there is expected to be an increase in ergative case in declaratives. If they extend the use of ergative case to *wh*-questions, this would suggest a recovery of an ergative pattern as opposed to a construction specific recovery. However, there is no expectation that there will be any increase of *–ina* in WhQs, as this group would not have been trained in this feature.

Syntactic Intervention Group: For those in the syntactic group who received intervention in *wh*-questions, an increase in both ergative case and *–ina* is expected for *wh*-questions. If the ergative case is also observed in declaratives, this would again suggest the recovery of a pattern of ergativity as opposed to a specific construction. If for some reason *–ina* is also extended to declaratives, this would suggest an overgeneralization of the suffix, indicating possible confusion regarding its use.

Control Group: For those in the control group that received no intervention, no increase in ergativity is expected. If significant increase is observed, this would suggest that any recovery of ergativity may be attributed to something other than the targeted intervention.

2. If key ergative features are indeed recoverable through targeted intervention, how durable would these recovered features be? This would be addressed from the results in Session II. If an increase of ergative features from the initial pretest is again observed in the delayed post-test, this would suggest a more durable recovery, that is, these recovered ergative features persist for at least three weeks, possibly indicating a lasting effect on underlying grammar.

3. If the recovery does demonstrate a durable change in grammar, to what extent has the grammar been affected? This would be addressed in the extenstion test, which should again be based heavily on the type of intervention the participant received.

Control Group: For the control group, no increase in ergative features in either relative clause production or resumptive pronoun judgement is expected.

Morphological Intervention Group: For the morphological group, if any increase is observed, it is expected to be the ergative case marker in relative clauses, which would further suggest that a pattern has been recovered. If an increase in resumptive pronoun judgement is observed as well, this would suggest sensitivity to syntactic ergativity even though they had only been trained in morphological ergativity. This type of extension is not expected as it is inconsistent with the entailment relationship between morphological and syntactic ergativity.

Syntactic Intervention Group: For the syntactic group, an increase in ergative features in relative clauses would suggest the recovery of a pattern as opposed to construction specific features. If an increase in resumptive pronoun judgement is also observed, this would definitively indicate an even more robust recovery of a pattern of ergativity in the underlying grammar.

4. If an underlying pattern of ergativity has indeed been recovered, can any differences be observed between the effects of intervention targeting morphological versus syntactic features? The key here is not only the recovery of ergative features, but also the differences in recovery between the morphological and syntactic groups. If the syntactic group outperforms the morphological group in the extent of recovery, this may substantiate the entailment relationship between morphological and syntactic ergativity, or perhaps at the very least suggest a more robust effect from the *wh*-question intervention as opposed to declarative intervention.
These predictions and more are assessed further in the following sections detailing the analysis and results.

5.3.5 Analysis

With the exception of the Resumptive Pronoun Judgment Task, all participant responses were audio recorded and later transcribed. Responses were coded for the use of the ergative case marker, as well as the transitive suffix *–ina*. Participant responses for the Resumptive Pronoun Judgement Task were recorded by particiants on their repsonse form. Ratings were later coded and analyzed to find mean scores for each item. The results for all tasks are presented in the following section.

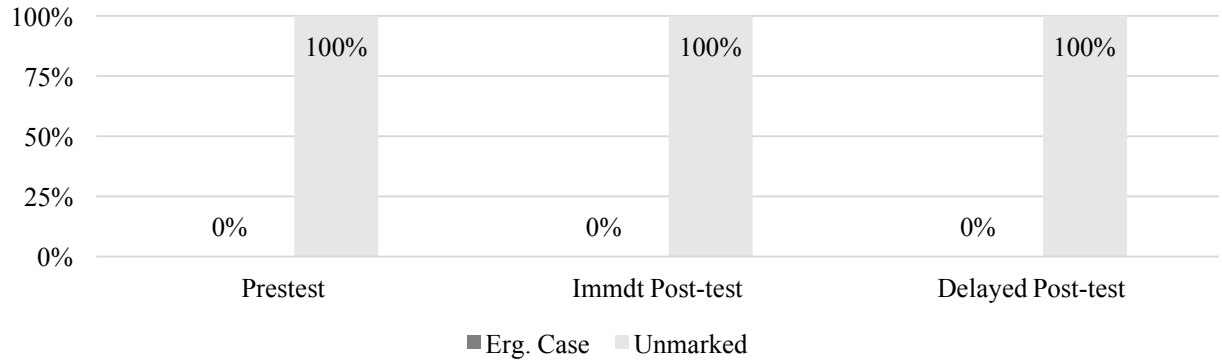
5.3.6 Results

The results for each participant group and each session are presented in the following three sub-sections. The Declarative and *Wh*-Question Results are displayed first, followed by the Relative Clause and Resumptive Pronoun Results.

5.3.6.1 Control Group

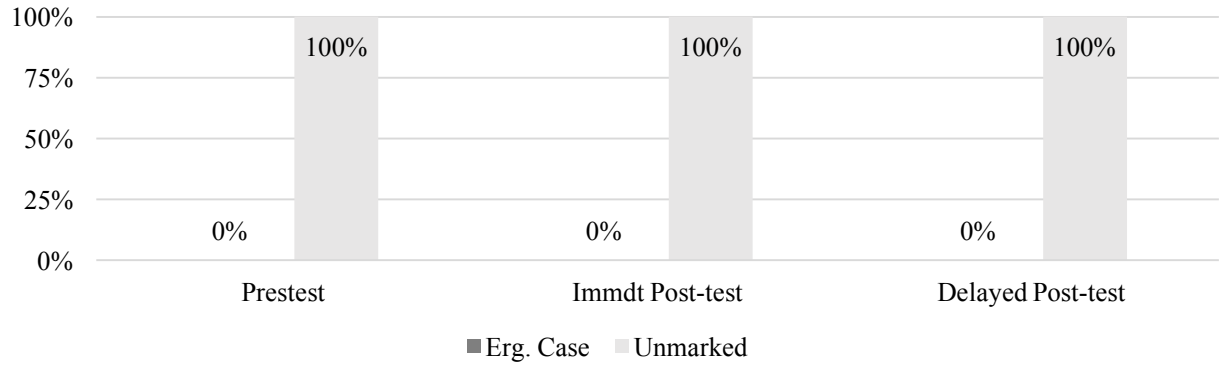
Presented in Figure 5.6 are the results from the Declarative Production Task across all three tests. Displayed are the rates at which participants produced the ergative case in transitive declaratives. The control group showed no production of ergative case in the pretest, and as expected, showed no improvement in both the immediate and delayed post-tests.

Figure 5.6. Control Group: Transitive Declarative Results (Ergative Case)



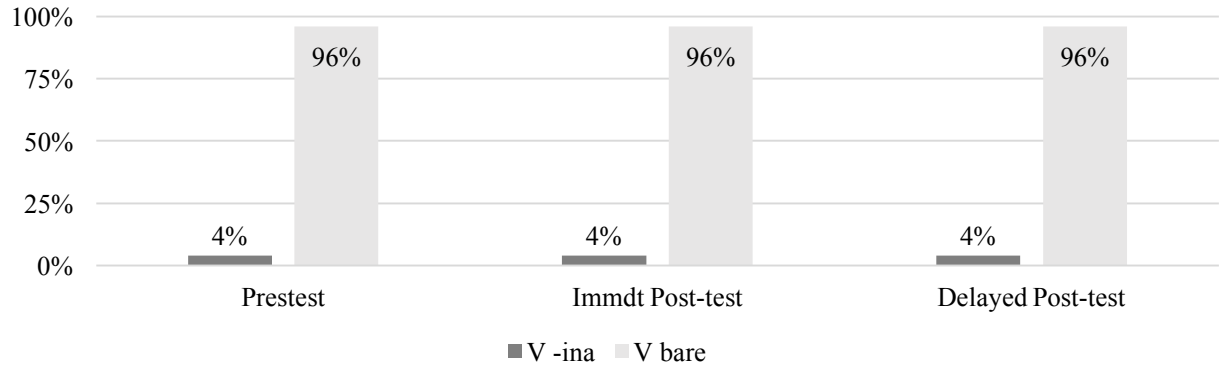
A similar result was observed in the *Wh*-Production Task. Presented in Figure 5.7 are the results for the production of ergative case in O-WhQs. Participants did not produce any ergative case in the pretest, nor did they produce the case marker in the immediate and delayed post-tests. This is again an expected result.

Figure 5.7. Control Group: O-WhQs Results (Ergative Case)



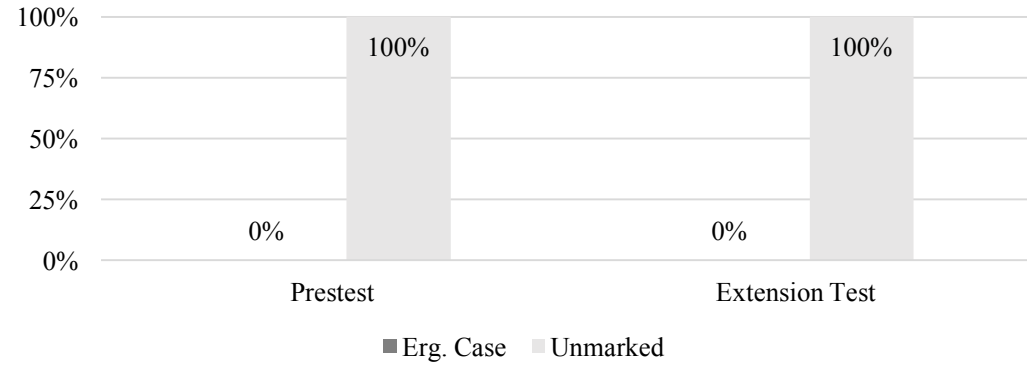
As far as the production of the transitive suffix *–ina*, an expected result was once again observed. Presented in Figure 5.8 are the rates that *–ina* was produced in A-WhQs across all three tests. The transitive suffix was only produced at a mere 4% in the pretest, and there was no increase in the immediate or delayed post-tests.

Figure 5.8. Control Group: A-WhQs Results *(-ina)*



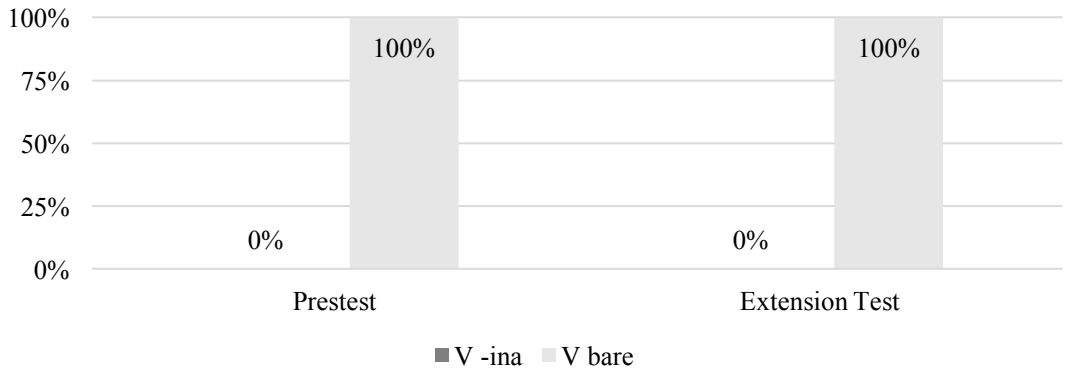
The Relative Clause Production Task saw the same results. In both the pretest and the extension test, the ergative case was never produced in O-RCs (Figure 5.9).

Figure 5.9. Control Group: O-RCs Results (Ergative Case)



Similarly, the transitive suffix *–ina* was never produced in A-RCs across both the pretest and extension test (Figure 5.10).

Figure 5.10. Control Group: A-RCs Results (*-ina*)



The Resumptive Pronoun Judgement Task again showed similar results. The pretest results showed that participants did not significantly discriminate between S and O relative clauses with resumptive pronouns (i.e. $p > .05$). The extension test showed that there was no significant difference in the scores from the pretest (Table 5.23).

Table 5.23. Control Group: Judgement Task Results (Test Items)

	Pretest		Extension Test	
RC-Type	**Mean Score**	**SD**	**Mean Score**	**SD**
A-RC w/o prn	4.37	1.09	4.50	0.93
A-RC w prn	4.93	0.26	4.90	0.31
O-RC w/o prn	5.00	0.00	4.97	0.09
O-RC w prn	4.10	0.75	4.05	0.83
S-RC w/o prn	4.97	0.13	4.93	0.20
S-RC w prn	3.93	0.89	4.00	0.85

Key Findings from Control Group:

The results observed here for the control group are as expected given the fact that participants did not receive any intervention. A summary of key findings from each task are presented below.

Table 5.24. Key Results from Declarative Production

		PRETST	IMMDT	DELYD
Group	**Qty**	**Erg. Case**	**Erg. Case**	**Erg. Case**
Heritage.C	15	0%	0%	0%

Table 5.25. Key Results from *Wh*-Question Production

		PRETST	IMMDT	DELYD	PRETST	IMMDT	DELYD
		O-WhQs:	O-WhQs:	O-WhQs:	A-WhQs:	A-WhQs:	A-WhQs:
Group	**Qty**	**Erg.Case**	**Erg.Case**	**Erg.Case**	***-ina***	***-ina***	***-ina***
Heritage.C	15	0%	0%	0%	4%	4%	4%

Table 5.26. Key Results from Relative Clause Production

Group	Qty	PRETST O-RCs: Erg. Case	EXTN O-RCs: Erg. Case	PRETST A-RCs: *-ina*	EXTN A-RCs: *-ina*
Heritage.C	15	0%	0%	0%	0%

Table 5.27. Key Results from Resumptive Pronoun Judgement

Group	Qty	PRETST S-RCs: w pronoun	EXTN S-RCs: w pronoun	PRETST O-RCs: w pronoun	EXTN O-RCs: w pronoun
Heritage.C	15	3.93	4.00	4.10	4.05

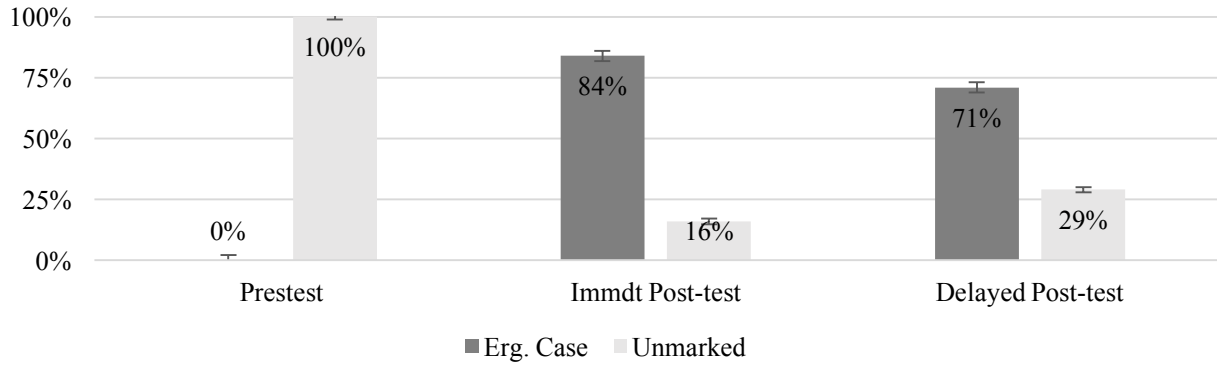
– Difference in scores are statistically insignificant. –

The next section presents the results for the morphological group.

5.3.6.2 Morphological Group

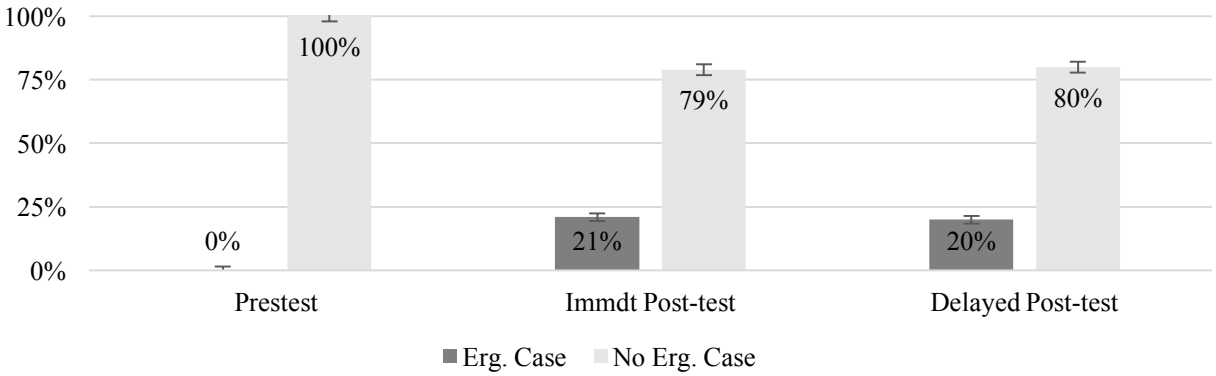
The morphological group are those participants that were given the Declarative Intervention Task. Figure 5.11 presents the results from the Declarative Production Task for the transitive declarartive items across the three tests. The pretest showed a complete lack of the ergative case marker at a 0% production rate. However, following the intervention, a significant increase was observed where the ergative case was produced at a rate of 84% in the immediate post-test. Even after the 2-3 week interval, participants still produced the case marker at a significantly high rate of 71%. These results show a substantial and durable effect of the Declarative Intervention Task in the use of the ergative case in transitive declarative production.

Figure 5.11. Morphological Group: Trans. Declarative Results (Erg Case)



The effects of Declarative Intervention on the production of ergative case was also observed in O-WhQs, even though participants were not trained in *wh*-questions (Figure 5.12). Although the pretest showed no signs of ergative case in O-WhQs, the immediate post-test showed a significant increase to a rate of 21%. This was sustained 2-3 weeks later in the delayed post-test at a rate of 20%. This result suggests that even though they were trained only in transitive declaratives, they have recovered, to some degree, a more general use of the ergative case marker, appropriately applying it to O-WhQs. It is important to note that the participants crucially did not overgeneralize the ergative case marker to S or A-WhQs. They reserved its use only to mark A arguments in O-WhQs.

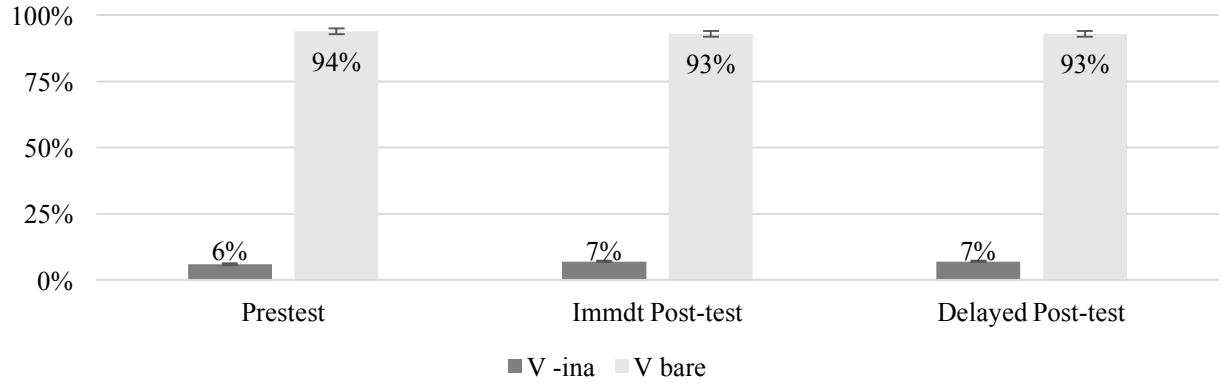
Figure 5.12. Morphological Group: O-WhQs Results (Erg Case)



In contrast, the production of the transitive suffix *–ina* in A-WhQs (Figure 5.13) did not show any significant increases. The pretest showed that *–ina* was produced at a mere 6%. The immediate and delayed post-tests showed *–ina* at a rate of 7%. This insignificant difference in

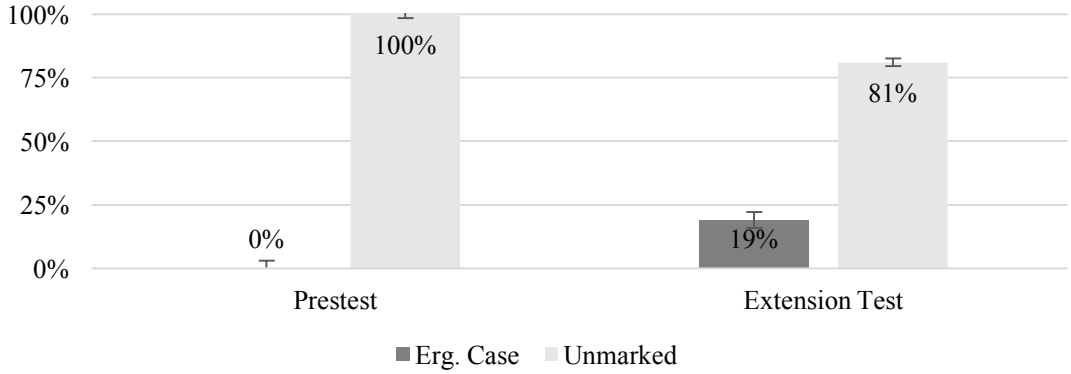
production rate is expected, given the fact that participants were never trained in the use of the transitive suffix.

Figure 5.13. Morphological Group: A-WhQs Results *(-ina)*



Relative Clause Production showed a similar result. While the ergative case marker never ocurred in the pretest (0%), the extension test showed a significant increase to 19%. This further suggests that participants have recovered a more general pattern of use for the ergative case marker. Not only did they extend it to *wh*-questions, but also to relative clauses, two distinct constructions for which they had no training. Furthermore, they did not overgeneralize the ergative case marker to S or A-RCs.

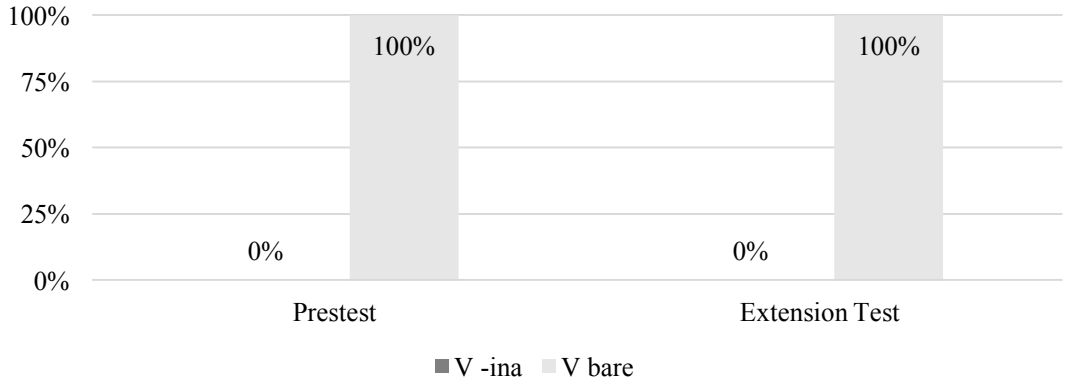
Figure 5.14. Morphological Group: O-RCs Results (Erg. Case)



In contrast to O-RCs, A-RCs showed no increase in the use of the transitive suffix *–ina*. In fact, *-ina* never ocurred in both the pretest or the extension test. This is expected as

participants were never trained in the use of the suffix for either relative clauses or *wh*-questions. These results can be seen in Figure 5.15.

Figure 5.15. Morphological Group: A-RCs Results (*-ina*)



Similar results were observed in the Resumptive Pronoun Judgement Task (Table 5.28). The pretest showed no significant differences between relative clauses with and without resumptive pronouns, namely S and O (i.e. $p > .05$). The extension test showed no significant differences. This is understandable given the fact that particpants were never trained in resumptive pronouns or any syntactically ergative construction.

Table 5.28. Morphological Group: Judgement Task Results (Test Items)

	Pretest		**Extension Test**	
RC-Type	**Mean Score**	**SD**	**Mean Score**	**SD**
A-RC w/o prn	3.85	1.40	4.48	0.75
A-RC w prn	4.03	1.36	4.57	0.72
O-RC w/o prn	4.25	1.24	4.63	0.54
O-RC w prn	3.53	1.46	3.92	1.14
S-RC w/o prn	4.07	1.38	4.73	0.46
S-RC w prn	3.37	1.58	3.38	1.40

Key Findings from Morphological Group:

The results from the morphological group has shown that declarative intervention is indeed effective in recovering the ergative case marker in transitive declaratives. It also shows that a pattern of morphological ergativity has been recovered by the fact that the ergative case was extended to both *wh*-questions and relative clauses. Syntactic ergativity, however, seems to have alluded participants with no significant effect observed in the production of *–ina* or the judgement of resumptive pronouns, revealing some of the limitations of the Declarative Intervention Task. A summary of key results from the morphological group are presented below.

Table 5.29. Key Results from Declarative Production

		PRETST	IMMDT	DELYD
Group	**Qty**	**Erg. Case**	**Erg. Case**	**Erg. Case**
Heritage.M	15	0%	84%	71%

Table 5.30. Key Results from *Wh*-Question Production

		PRETST	IMMDT	DELYD	PRETST	IMMDT	DELYD
		O-WhQs:	O-WhQs:	O-WhQs:	A-WhQs:	A-WhQs:	A-WhQs:
Group	**Qty**	**Erg.Case**	**Erg.Case**	**Erg.Case**	***-ina***	***-ina***	***-ina***
Heritage.M	15	0%	21%	20%	6%	7%	7%

Table 5.31. Key Results from Relative Clause Production

		PRETST	EXTN	PRETST	EXTN
		O-RCs:	O-RCs:	A-RCs:	A-RCs:
Group	**Qty**	**Erg. Case**	**Erg. Case**	***-ina***	***-ina***
Heritage.M	15	0%	19%	0%	0%

Table 5.32. Key Results from Resumptive Pronoun Judgement

Group	Qty	PRETST S-RCs: w pronoun	EXTN S-RCs: w pronoun	PRETST O-RCs: w pronoun	EXTN O-RCs: w pronoun
Heritage.M	15	3.37	3.38	3.53	3.92

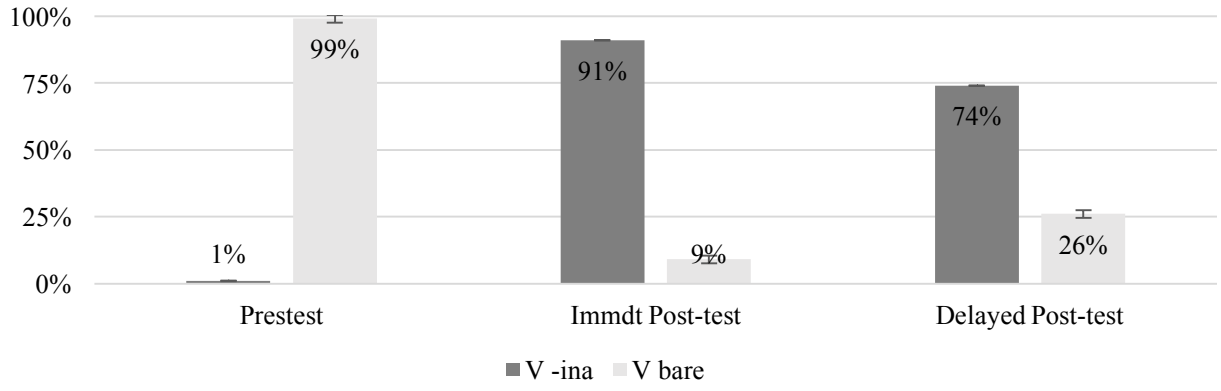
– Difference in scores are statistically insignificant. –

The next section presents the results observed from the syntactic group who were given the *Wh*-Question Intervention Task.

5.3.6.3 Syntactic Group

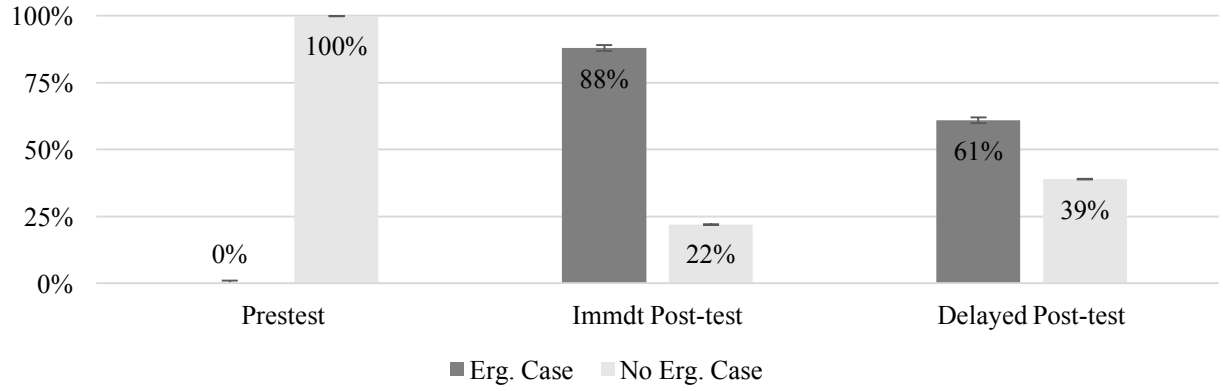
For the syntactic group, the *wh*-question results are presented first, for which they received an intervention, followed by the declarative, relative clause, and resumptive pronoun results, for which no intervention was received. Figure 5.16 displays the results for A-WhQs across all three tests. The pretest showed a mere 1% production rate for the *–ina* suffix, however, following the intervention, production of *–ina* significantly increased to 91%. Even after the 2-3 week interval, *-ina* was sustained at a rate of 74%.

Figure 5.16. Syntactic Group: A-WhQs Results *(-ina)*



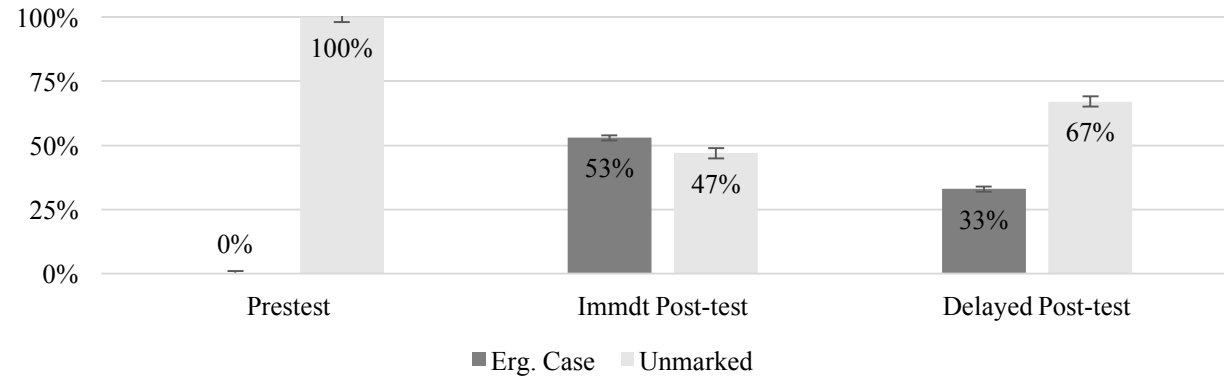
For O-WhQs (Fig. 5.17), the ergative case was never produced in the pretest. However, in the immediate post-test, use of the ergative case increased to 88%, and was sustained in the delyaed post-test at a rate of 61%.

Figure 5.17. Syntactic Group: O-WhQs Results (Erg Case)



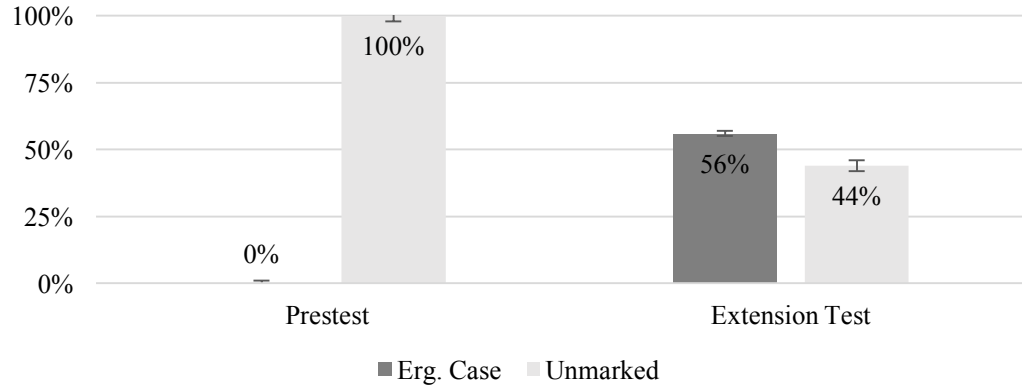
These results show that the *Wh*-Question Intervention Task was effective in recovering key syntactic ergative features in *wh*-questions. Moreover, the results from the declarative production task, for which no intervention was given, shows an extension of the ergative case to transitive declaratives at a rate of 53% in the immediate post-test and 33% in the delayed post-test (Fig. 5.18). This is a substantial increase given that the ergative case never occurred in the pretest.

Figure 5.18. Syntactic Group: Trans. Declarative Results (Erg Case)



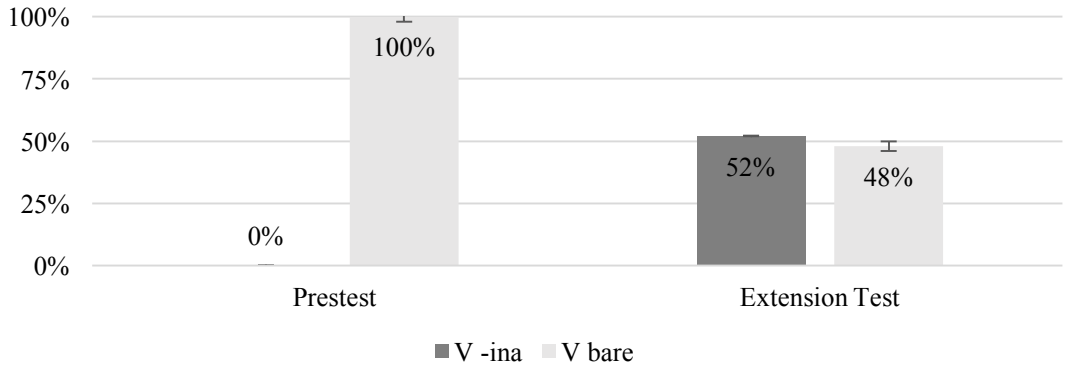
In fact, the ergative case was also extended to relative clauses. Ergative case was absent in the pretest, however, the extension test showed a significant increase to 56%, suggesting the recovery of morphological ergativity as a pattern.

Figure 5.19. Syntactic Group: O-RCs Results (Erg. Case)



The result from A-RCs corroborate this idea by showing that the transtitive suffix *–ina* was also extend to relative clauses increasing from a rate of 0% in the pretest to 52% in the extension test. This suggests that a more general pattern of syntactic ergativity has also been recovered given the fact that *–ina* was extended from *wh*-questions to a similar, yet distinct, construction, relative clauses.

Figure 5.20. Syntactic Group: A-RCs Results (*-ina*)



A pattern of syntactic ergativity becomes even more apparent with the results from the Resumptive Pronoun Judgement Task. The pretest showed that participants do not discriminate to a significant degree between relative clauses with or without resumptive pronouns. However, the extension test showed a significant change in judgement, that is, participants only accepted A-RCs with resumptive pronouns, not S or O-RCs (Table 5.33). This is a significant result given the fact that participants never received any intervention specifically targetting resumptive pronouns; rather, they were trained in a different ergative feature (i.e. *–ina*) in a different

construction (i.e. *wh*-questions) and yet extended the overall pattern of ergativity to resumptive pronouns in relative clauses.

Table 5.33. Syntactic Group: Judgement Task Results (Test Items)

	Pretest		Extension Test		
RC-Type	**Mean Score**	**SD**	**Mean Score**		**SD**
A-RC w/o prn	4.23	1.19	4.30		0.92
A-RC w prn	4.27	1.19	4.22		0.77
O-RC w/o prn	4.38	1.06	4.08	*	0.90
O-RC w prn	3.73	1.40	2.00		1.29
S-RC w/o prn	4.48	1.09	4.77	*	0.25
S-RC w prn	3.60	1.42	3.18		1.43

*$p < .05$

Key Findings from Syntactic Group:

The results observed here from the syntactic group demonstrate significant effects from the *Wh*-Question Intervention Task. Participants were exposed to both ergative case and *–ina* within the context of *wh*-questions. From these cues, evidence suggesting a pattern of both morphological and syntactic ergativity was observed. The ergative case marker (i.e. morphological) was not only recovered in *wh*-questions, but also extended to declaratives and relative clauses. The transitive suffix *–ina* (i.e. syntactic) was also recovered in *wh*-questions and extended to relative clauses as well. This syntactically ergative pattern was further extended to resumptive pronouns, for which participants did not recieve any training or have prior exposure. A summary of key results is presented in the tables below.

Table 5.34. Key Results from *Wh*-Question Production

Group	Qty	PRETST O-WhQs: Erg.Case	IMMDT O-WhQs: Erg.Case	DELYD O-WhQs: Erg.Case	PRETST A-WhQs: *-ina*	IMMDT A-WhQs: *-ina*	DELYD A-WhQs: *-ina*
Heritage.S	15	0%	88%	61%	1%	91%	74%

Table 5.35. Key Results from Declarative Production

Group	Qty	PRETST Erg. Case	IMMDT Erg. Case	DELYD Erg. Case
Heritage.S	15	0%	53%	33%

Table 5.36. Key Results from Relative Clause Production

Group	Qty	PRETST O-RCs: Erg. Case	EXTN O-RCs: Erg. Case	PRETST A-RCs: *-ina*	EXTN A-RCs: *-ina*
Heritage.S	15	0%	56%	0%	52%

Table 5.37. Key Results from Resumptive Pronoun Judgement

Group	Qty	PRETST S-RCs: w pronoun	EXTN S-RCs: w pronoun	PRETST O-RCs: w pronoun	EXTN O-RCs: w pronoun
Heritage.S	15	3.60	3.18	3.73	2.00

– Difference in scores are statistically significant. ($p < .05$) –

The implications of these results, as well the results observed in the control and morphological groups are explored in detail in the following section.[4]

[4] It should be noted that there were no item effects observed in any of the groupd in the post or extension tests.

5.3.7 Discussion

The results of the experiments presented in the previous sections directly address the four research questions laid out for the current study, each of which is addressed here.

1. Can the ergative features initially found lacking in heritage grammar be recovered through careful linguistic intervention?

The results from the immediate post-tests show that recovery is indeed possible. Targeted intervention was shown to be the catalyst for this recovery. The control group (who did not receive intervention) showed no signs of increased ergativity. Only those groups (i.e. morpohological and syntactic) that received some form of intervention were able to successfully recover key ergative features. This result demonstrates the decisive role of targeted intervention.

2. If key ergative features are indeed recoverable through targeted intervention, how durable would these recovered features be?

The durability of the recovery was elucidated by the results of the delayed post-test showing that recovered ergative features were significantly sustained for up to three weeks. There was, however, some attrition detected in the delayed post-test. For this reason, further study is required to determine the full extent of durability. Nevertheless, the intervention was shown to have a considerably enduring effect.

3. If the recovery does demonstrate a durable change in grammar, to what extent has the grammar been affected?

This question was elucidated by the results from the extension tests. All ergative features recovered were significantly extended to structures that were not included in the intervention. The morphological group extended the ergative case marker to wh-questions and relative clauses, while the syntactic group appropriately extended both –ina and the ergative case to declaratives and relative clauses. The syntactic group also extended this ergative pattern to resumptive pronouns. This suggests that recovery in both groups was not construction specific, but rather a general pattern of ergativity accross a variety of constructions.

4. If an underlying pattern of ergativity has indeed been recovered, can any differences be observed between the effects of intervention targeting morphological versus syntactic features?

The results demonstrate that although the morphological group, trained only in declaratives (i.e. ergative case), was able to recover a pattern of morphological ergativity accross a variety of structures, they failed to recover any sign of syntactic ergativity. The syntactic group, on the other hand, trained only in wh-questions (i.e. ergative case and –ina), experienced a much more robust recovery. They were able to recover a pattern of both morphological and syntactic ergativity, even in features for which they had not received training. These results suggest that intervention including syntactic ergativity may yield a more robust recovery than intervention targeting only morphological ergativity. This result is consistent with the entailment relationship that has been observed typologically regarding morphological and syntactic ergativity, that is, a language can have morphological ergativity without syntactic ergativity, but not vice versa (Dixon 1979). In this way, an intervention targeting syntactically ergative features may also reinforce the recovery of morphologically ergative features, resulting in a more fundamental change in grammar. However, because the wh-question intervention received by the syntactic group received elements of both morphological (i.e. case) and syntactic (i.e. –ina), it is difficult to tease apart the effects of exposure to syntactic ergativity alone from the joint effect of exposure to both types of ergativity. Nevertheless, the results observed here point to the fact that additional exposure to syntactically ergative features along with morphological ergative features appears to play a pivotal role in the recovery or ergativity.

The current study has demonstrated that the gap in ergativity present in Samoan heritage grammar can indeed be filled through targeted intervention. This recovery of ergativity is durable (i.e. at least up to three weeks) and extensive (i.e. underlying pattern accross a range of structures). Furthermore, syntactically ergative cues proved to yield a broader range of grammatical features (i.e. syntactic and morphological) than exclusively morphological cues. The recovery observed here in heritage grammar is indeed robust, suggesting enduring effects to underlying grammar.

This impressive result gives rise to yet another intriguing question, that is, is this remarkable recovery due to the fact that the recovered features are part of implicit knowledge already present in the grammar that have been dormant since childhood, only now reactivated?

Or is it merely the result of fresh knowledge acquired as an adult, and the extensive increase of ergative features is a testament to the effectiveness of the intervention, rather than latent grammatical knowledge? This question has far-reaching implications, and for this reason, is the focus of the final study presented in the following chapter investigating the stability of ergativity in L2 Samoan.

Chapter 6. Experiment 4: An Ergative Intervention in L2 Samoan

The previous chapter demonstrated that the gap in ergativity in Samoan heritage grammar can indeed be filled through targeted intervention. The result is a durable (i.e. at least up to three weeks) and extensive (i.e. underlying pattern accross a range of structures) recovery of both morphological and syntactic ergativity, suggesting enduring effects to underlying grammar.

This impressive result of ergative intervention in heritage Samoan poses yet another intriguing question as to the source of recovery. Recall that heritage speakers are those that received substantial input in the home language up until roughly the onset of schooling. Thereafter, the dominant language takes over, and the home language begins to recede. So the intriguing question here is whether the impressive recovery witnessed in the previous chapter is due to the fact that the recovered features are part of implicit knowledge already present in the grammar that have been dormant since childhood, and only now reactivated? Or is it merely the result of fresh knowledge acquired as an adult, and the extensive increase of ergative features is a testament to the effectiveness of the intervention, rather than latent grammatical knowledge? The current chapter seeks to investigate this question by investigating two potential explanations to account for the heritage recovery of ergativity: i) the Permanence Hypothesis, and ii) the Contigency Hypothesis.

The Permanence Hypotheses (Brenner 2010, as cited in Benmamoun, Montrul, & Polinsky 2013) states that knowledge acquired during the critical period remains permanently, due to the fact that the cognitive resources committed to that particular language during childhood cannot be reassigned. Therefore, the grammatical knowledge specific to that language persists into adult life, although perhaps unrealized. On this view, the knowledge gained during an intervention is due to the buttressing of already-present knowledge in heritage grammar. This would mean that heritage speakers, having had an opportunity to acquire ergative alignment during critical learning periods as a child, have a predisposition for ergativity. This could account for the extensive recovery of ergative features in heritage Samoan through targeted intervention.

An alternative view is the Contingency Hypothesis (Brenner 2010; as cited in Benmamoun, Montrul, & Polinsky 2013), that is, cognitive resources committed to a particular language can indeed be subsequently reassigned due to a change in input. For Samoan heritage speakers, this would mean that any childhood knowledge of ergativity would have attrited in the

face of exposure to the majority language (i.e. English). Any recovery, then, would be due to simple (L2) learning (i.e. the acquisition of new knowledge). According to this view, there is no learning benefit to knowledge acquired as a child that is then lost due to attrition. The extensive recovery of ergativity in heritage Samoan could not be attributed, then, to pre-existing knowledge, but rather perhaps, to the effectiveness of the intervention methodology.

To address these hypotheses, a final experiment was carried out. This experiment targeted L2 speakers of Samoan. The L2 speakers for the purposes of this study were all native speakers of English that have had no exposure to the Samoan language during critical learning periods. They would not have had any opportunity to aquire any of the relevant ergative features or ergative alignment for that matter (given that English is an accusative language) during childhood. All learning of Samoan had taken place as an adult. L2 speakers of Samoan, then, present a unique opportunity to investigate the Permanence and Contigency Hypotheses by comparing the result of an ergative intervention in L2 grammar with what was observed in heritage grammar.

If L2 speakers perform the same or even better than heritage speakers, this would suggest that the recovery seen in heritage speakers is a result of fresh knowledge acquired as an adult (i.e. Contigency Hypothesis). However, if heritage speakers are shown to have a significantly more robust recovery than their L2 counterparts, this would suggest that the recovery of ergativity in heritage grammar may indeed be a result of residual knowledge that had been acquired as a child, but later became dormant due to decreased exposure to the language (i.e. Permanence Hypothesis).

The following sections present the final experiment carried out in the investigation of recovering ergativity in heritage Samoan, by first contextualizing this study within the framework of the Permanence and Contigency Hypotheses, as well as the second laguage acquisition of Samoan. The design, method, and results if the experiment are then presented, followed by a detailed discussion of findings.

6.1 Permanence vs. Contigency

The Permanence and Contigency Hypotheses bring heritage language to the forefront of language development research as a unique opportunity to investiagte the stability of linguistic features acquired during critical learning periods in childhood. The Contingency Hypothesis

posits that the longevity of a particular linguistic feature is dependent upon the amount of input the learner receives throughout life, while the Permanence Hypothesis posits that although change in exposure can lead to a redirecting of cognitive resources, the linguistic knowledge that was already acquired during critical learning periods is never lost. This would mean that although heritage speakers may appear to be lacking in key grammatical features from their heritage language, this knowledge need not be reacquired, but rather, merely reactivated. In this view, then, heritage speakers should benefit from their childhood learning, giving them an advantage over second language speakers, in gaining key linguistic features from their heritage language.

These two hypotheses have been the focus of a series previous studies on language development, lending support to both hypthoses. Palier et al (2003) tested Korean adoptees living in France, who had been adopted between the ages of 3 and 8 years old, and had reported no working knowledge of Korean. They tested whether they could distinguish Korean from other foreign languages. The results showed that Korean adoptees performed the same as monolingual French speakers. This suggests that any knowledge of Korean they had acquired before adoption had been lost. Similarly, Ventureyra et al (2004) tested a different group of Korean adoptees in France to investigate whether they were sensitive to certain consonant clusters. Again, the Korean adoptees performed the same as monolingual French speakers. Both of these studies support the Contigency Hypothesis.

However, Bowers et al (2009) tested adults who had received significant exposure to Hindi and Zulu during childhood, in their sensitivity to phonemic contrasts absent in English. Initial results showed poor performance (i.e. the same as English monolinguals), suggesting no concious memory of the language. However, after continual exposure, participants were shown to achieve close to native-like proficiency in the language they had been exposed to as a child. Oh et al (2010) tested Korean adoptees in the second week of an introductory Korean language class. In this study, the Korean adoptees clearly outperformed their non-adoptee counterparts in their sensitivity to a three way phonemic distinction in Korean, that is absent in English (i.e. lenis-tense-aspirated). These two studies demonstrate support for the Permanence Hypothesis.

While further research is needed to categorically confirm or dismiss either theory, these studies collectively suggest that knowledge acquired during critical learning periods becomes inaccessible due to shift in language exposure. However, reexposure to the heritage language

may serve to trigger or reactivate latent knowledge (Benmamoun et al 2013). This was clearly demonstrated by Bowers et al (2009) and Oh et al (2010). While Palier et al (2003) and Ventureyra (2004) showed an initial lack of knowledge, they did not test whether reexposure to the language could have made an impact. This may have lead to more support for the Permanence Hypothesis, rather than Contigency. Nevertheless, these studies demonstrate the need for further research in this area, which is the goal of the current study. Thus far, the studies addressing Permanenence and Contigency have focused on phonogical features. The current study seeks to contribute to the literature by investigating these issues in morphology and syntax.

6.2 Samoan Second Language Acquisiton (SLA)

Although ergativity has received scant attention in the SLA literature, studies thus far have shown that ergative features, namely case, are late acquired and often unstable features for L2 learners of some of the world's ergative languages (Urdu – Ranjan, 2016; Hindi – Baten & Verbeke, 2015; Basque – Ezeizabarrena, 2012, Rodriguez-Ordonez, 2015). L2 learners of Samoan have shown many of these same traits.

Muāgututi'a (2010) investigated the acquisition of ergativity by L1 English speakers learning Samoan at the University of Auckland. 18 students were audio recorded performing picture description tasks that had been trialled on native speakers, and shown to be effective in eliciting target structures (e.g. ergative case in declarative transitives). 6 of the students were in their first semester, 6 from their second semester, and 6 from their third semester of Samoan language study. The constructions that emerged in the data were used to place learners at different developmental stages to establish an aquisition order of key linguistic features in an implicational hierarchy. Of the eight features elicited (i.e. predicate marker, tense, subject relative clause, oblique relative clause, control, agreement, clitic pronoun, ergative case), the ergative case marker was found to be the last to emerge. In fact, only two of the 18 participants were shown to have acquired ergative case marker, only after acquiring all of the other structures first.

Ergative alignment, then, for L2 learners poses a significant challenge in acquiring the Samoan language as it does for heritage speakers as well. This provides an ideal opportunity to compare the resiliency of ergativity between the two speaker groups. The following section details the intervention experiment carried out to investigate this issue in L2 speakers of Samoan.

6.3 L2 Intervention

The purpose of this experiment was to investigate ergativity in the grammar of L2 speakers of Samoan in order to establish a baseline of recoverability to compare with the results observed in heritage speakers. The comparison of heritage and L2 responses to targeted intervention directly addresses the final research question as to the source of heritage recovery (i.e. Permanence or Contigency).

L2 speaker participants were administered the same series of elicitation tasks given to the heritage speaker participants in the previous chapter. They were taken through a pretest, intervention, immediate post-test, delayed post-test, and extension test where key ergative features (i.e. ergative case, *-ina*, resumptive pronouns) were elicited in declaratives, *wh*-questions, and relative clauses. The rates at which these ergative features were produced were tracked throughout the various stages of the study to measure any increase in the production of ergativity. The study is presented in its entirety in the following sections (i.e. method, design, results, and discussion).

6.3.1 Participants

A total of 30 participants (18 male, 12 female; age 19 to 35) were recruited from the Samoan Language Program at the University of Hawai‘i at Mānoa. All were currently enrolled in an intermediate level Samoan class. A language background survey was administered to establish their language profile as fitting that of an L2 speaker (see Appendix A), that is, none of the participants had been exposed to the Samoan language before the age of 18. A cloze test was also administered to ensure a comparable proficiency in Samoan amongst participants (scores ranged from 55% - 100% with an average score of 76% – see Appendix B for complete results).

As with the heritage speakers, L2 participants were assigned at random to three separate groups. 10 participated as the control group (i.e. no intervention), 10 participated as the morphological group (i.e. declarative intervention), and another 10 participated as the syntactic group (i.e. *wh*-question intervention). The details of each intervention type are provdied in the next session, and a full list of participant groups can be found in Appendix G.

6.3.2 Materials and Design

The same six tasks used in the previous chapter were again employed here: 1) Declarative Sentence Completion Task, 2) *Wh*-Question Production Task, 3) Relative Clause Production Task, and 4) Resumptive Pronoun Judgement Task, 5) Declarative Intervention Task, and 6) *Wh*-Question Intervention Task. Each of these tasks were administered in the same way as the previous studies.

The tasks were divided into five stages: i) pretest, ii) intervention, iii) post-test, iv) delayed post-test, and v) extention test. A full description of each stage and the tasks therein are given in the following sections.

6.3.2.1 Pretests

Participants were first administered a series of pretests to establish a baseline of ergativity from which any increase following the intervention could be measured. This initial stage consisted of the four core elicitation tasks used in previous chapters: 1) declarative production, 2) *wh*-question production, 3) relative clause production, and 4) resumptive pronoun grammaticality judgement.

Table 6.1. Session I: Prestests

1) Declarative Sentence Completion Task
2) Wh-Question Production Task
3) Relative Clause Production Task
4) Resumptive Pronoun Judgement Task

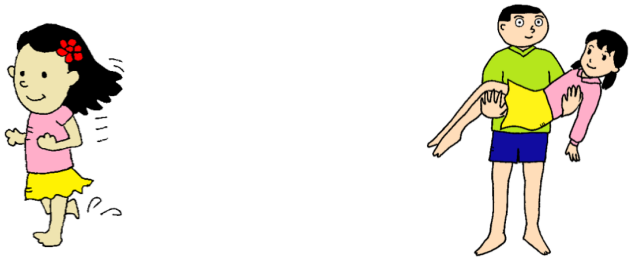
Each was presented to the participant in the order displayed in Table 5.2, and each are described in detail below.

6.3.2.1.1 Declarative Sentence Completion Task – Materials and Procedure

This was the exact same task presented in previous chapters. The purpose was to measure the rate at which participants produce ergative case marking in declarative sentences (i.e. marking A arguments with *e*, while leaving S and O arguments unmarked). Participants were presented 10 test items (5 intransitive, 5 transitive) for which they were tasked with producing a declarative sentence describing each. An example of the two item types is presented in Figure 6.1.

Figure 6.1. Sample of intransitive and transitive pictures

a) Intransitive Item b) Transitive Item



All items depicted animate characters. A list of the verbs used are listed in Table 6.2. The full set of items can be seen in Appendix C.

Table 6.2. Elicited Verbs for Declarative Completion Task

Intransitive Verbs			Transitive Verbs		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo‘e*	‘run’	1.	*si‘i*	‘lift’
2.	*Nofo*	‘sit’	2.	*tūlei*	‘push’
3.	*‘ata*	‘laugh’	3.	*toso*	‘pull’
4.	*tā‘ele*	‘bathe’	4.	*fa‘asusū*	‘spray’
5.	*tū*	‘stand’	5.	*fusi*	‘hug’
6.	*tagi*	‘cry’	6.	*tuli*	‘chase’
7.	*tā‘alo*	‘play’	7.	*kiki*	‘kick’
8.	*siva*	‘dance’	8.	*matamata*	‘watch’
9.	*pa‘ū*	‘fall’	9.	*‘ini*	‘pinch’
10.	*oso*	‘jump’	10.	*tāofi*	‘stop’
11.	*faitau*	‘read’	11.	*‘u‘u*	‘hold’
12.	*ti‘eti‘e*	‘ride’	12.	*lagona*	‘hear’

Task items were presented individually to each participant on a laptop screen. Participants were given the first portion of a declarative sentence by the researcher, in this case, the verb (i.e. TAM and verb). They were then tasked with completing the sentence, essentially producing the appropriate arguments of the verb as they pertained to the picture. The 5 intransitive items were presented first, followed by the 5 transitive items.

An example of the protocol for the transitive item presented in Fig 6.1(b) is given here. The participant was first shown the picture on the laptop screen. The researcher then prompted the participant with the first portion of the sentence, in this case the verb: *‘olo‘o si‘i* ‘PROG lift’. The participant then completed the sentence by producing the two arguments with the appropriate case marking, in this case, the A argument, *e le tama* ‘ERG the boy’, and the O argument, *le teine* ‘the girl’ (6.1).

(6.1) Researcher Prompt: Expected Participant Response:

‘Olo‘o si‘i... *e le tama le teine.*

PROG lift ERG the boy the girl

‘The boy is lifting the girl.’

6.3.2.1.2 *Wh*-Question Production Task – Materials and Procedure

Immediately following the declarative production task, participants were given the *Wh*-Production Task (same protocol as in previous chapters). The purpose of this task was to investigate the production of two key ergative features in *wh*-questions, one morphological and the other syntactic. The first feature was the use of ergative case in O-WhQs to mark the A argument in the embedded clause (morphological, 6.2). The second feature was the use of the transitive suffix *–ina* in A-WhQs (syntactic, 6.3).

(6.2) O-WhQ (Ergative Case):

‘O ai ‘olo‘o si‘i e le tama?

PRD who PROG lift ERG the boy

‘Who is the boy lifting?’

(6.3) A-WhQ (Transitive Suffix *–ina*):

‘O ai ‘olo‘o si‘iina le teine?

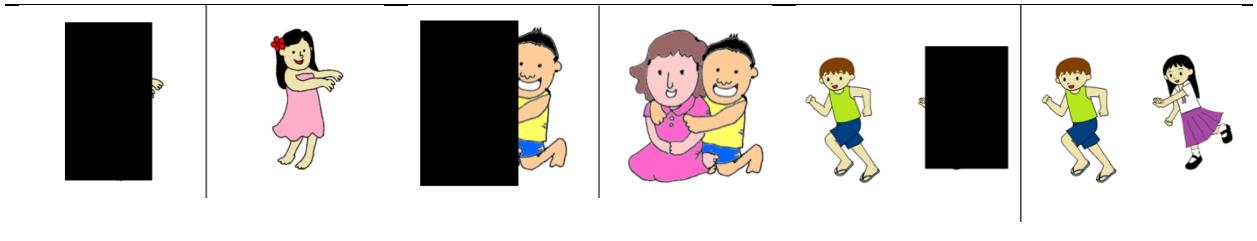
PRD who PROG lift.*ina* the girl

‘Who is lifting the boy?’

Participants were shown a series of pictures where they were prompted to produce a *wh*-question as it pertained to the action depicted. There were a total of 15 items, 5 designed to elicit S-WhQs, 5 to elicit O-WhQs, and 5 to elicit A-WhQs. An example of each item type is presented in Figure 6.2.

Figure 6.2. Sample of elicitation items from the *Wh*-Question Production Task

a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item



All items depicted animate characters. A list of the verbs used are listed in Table 6.3. The full set of items can be seen in Appendix D.

Table 6.3. Elicited Verbs for *Wh*-Question Production Task

Intransitive Verbs			**Transitive Verbs**		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the participants the following prompt (in Samoan) to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 6.4. The S items were presented first, followed by the O items, and then the A items.

Table 6.4. Examples of *Wh*-Question Prompts

No.	Type	Prompt
(a)	S-WhQ Item:	*'Olo'o siva se isi. Fesili mai po 'o ai.* PROG dance a other ask DIR PRT PRD who 'Someone is dancing. Ask me who.'
(b)	O-WhQ Item:	*'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.* PROG hug ERG the boy a other ask DIR PRT PRD who 'The boy is hugging someone. Ask me who.'
(c)	A-WhQ Item:	*'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.* PROG pull ERG a other the boy ask DIR PRT PRD who 'Someone is chasing the boy. Ask me who.'

For the S items, participants were expected to produce a *wh*-question with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb in the embedded clause along with the remaining A argument marked by the ergative case. And finally, for the A items, they were expected to produce the transitive suffix –*ina* on the verb with an unmarked O argument in the embedded clause as the target structure. An example of each is given in Table 6.5.

Table 6.5. Examples of Predicted *Wh*-Question Responses

No.	Type	Predicted Participant Repsonse
(a)	S-WhQ Item	*'O ai 'olo'o siva?* PRD who PROG run 'Who is dancing?'
(b)	O-WhQ Item	*'O ai 'olo'o fusi e le tama?* PRD who PROG hug ERG the boy 'Who is the boy hugging?'
(c)	A-WhQ Item	*'O ai 'olo'o tuliina le tama?* PRD who PROG chase.*ina* the boy 'Who is chasing the boy?'

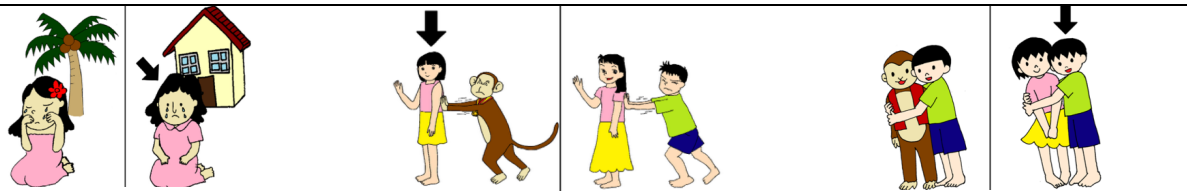
6.3.2.1.3 Relative Clause Production Task – Materials and Procedure

Following the *wh*-question production task, the participant was then presented with the Relative Clause Production Task (same as previous chapters). The purpose of this task was to investigate the production of the same two key ergative features in relative clauses, that is, the use of ergative case in O-RCs to mark the A argument within the relative clause (morphological), and the use of the transitive suffix *–ina* on the verb in A-RCs (syntactic).

Participants were shown a series of pictures where they were prompted to produce a relative clause to describe the action depicted. There were a total of 15 items, 5 designed to elicit S-RCs, 5 to elicit O-RCs, and 5 to elicit A-RCs. An example of each item type is presented in Figure 6.3.

Figure 6.3. Sample of elicitation items from the Relative Clause Production Task

a) S-RC Item b) O-RC Item c) A-RC Item



All items depicted animate characters. The verbs elicited in this task are listed in Table 6.6. The full set of items can be seen in Appendix E.

Table 6.6. Elicited Verbs for Relative Clause Production Task

Intransitive Verbs			Transitive Verbs		
No.	**Samoan**	**Gloss**	**No.**	**Samoan**	**Gloss**
1.	*tamo'e*	'run'	1.	*si'i*	'lift'
2.	*nofo*	'sit'	2.	*tūlei*	'push'
3.	*'ata*	'laugh'	3.	*toso*	'pull'
4.	*tā'ele*	'bathe'	4.	*fa'asusū*	'spray'
5.	*tū*	'stand'	5.	*fusi*	'hug'
6.	*tagi*	'cry'	6.	*tuli*	'chase'
7.	*tā'alo*	'play'	7.	*kiki*	'kick'
8.	*siva*	'dance'	8.	*matamata*	'watch'
9.	*pa'ū*	'fall'	9.	*'ini*	'pinch'
10.	*oso*	'jump'	10.	*tāofi*	'stop'
11.	*faitau*	'read'	11.	*'u'u*	'hold'
12.	*ti'eti'e*	'ride'	12.	*lagona*	'hear'

Task items were presented individually to each participant. Participants were first shown the item without the arrow. They were then given a short description of the actions depicted on each side of the picture (see table 6.7 below). After hearing the description, an arrow appeared on the screen pointing to one of the characters depicted in the picture. The participant was then asked by the researcher, "Who is the arrow pointing to?". The participant then responded by producing a relative clause. The S items were presented first, followed by the O items, and then A items.

Table 6.7. Examples of Relative Clause Production Prompts

Type	Description	Prompt
S	*'Olo'o tagi le teine i luma o le niu.* PROG cry the girl in front of the coconut tree 'The girl is crying in front of the coconut tree.' *'Olo'o tagi le teine i luma o le fale.* PROG cry the girl in front of the house 'The girl is crying in front of the house.'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
O	*'Olo'o tūlei e le manukī le teine.* PROG push ERG the monkey the girl 'The monkey is pushing the girl.' *'Olo'o tūlei e le tama le teine.* PROG push ERG the boy the girl 'The boy is pushing the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'
A	*'Olo'o fusi e le tama le manukī.* PROG hug ERG the boy the monkey 'The boy is hugging the monkey.' *'Olo'o fusi e le tama le teine.* PROG hug ERG the boy the girl 'The boy is hugging the girl'	*'O ai 'olo'o fa'asino ai le 'āū?* PRD who PROG point PRN the arrow 'Who is the arrow pointing to?'

Based upon both the native speaker responses in the previous chapter, along with prescriptive descriptions of these constructions, we made the following predictions. For the S items, participants were expected to produce a relative clause with a bare verb (i.e. no transitive suffix) as the target structure. For the O items, they were expected to again produce a bare verb, along with an A argument marked by the ergative case marker. And finally, for the A items, they were expected to produce the transitive suffix *–ina* on the verb with an unmarked O

argument as the target structure. An example of each type of predicted response is presented in Table 6.8.

Table 6.8. Examples of Predicted Relative Clause Responses

Type	Predicted Participant Repsonse
S-Item	*le teine ʻoloʻo tagi i luma o le fale* the girl PROG cry in front of the house 'the girl that is crying in front of the house'
O-Item	*le teine ʻoloʻo tūlei e le manukī* the girl PROG push ERG the monkey 'the girl that the monkey is pushing'
A-Item	*le tama ʻoloʻo fusiina le teine* the boy PROG hug.*ina* the girl 'the boy that is hugging the girl.'

6.3.2.1.4 Relative Clause Resumptive Pronoun Judgement Task – Materials and Procedure

The final task of the pretest was the Relative Clause Resumptive Pronoun judgement Task. The purpose of this task was to investigate whether this syntactically ergative pattern could be observed in native speakers' grammaticality judgements of resumptive pronouns in relative clauses, that is, would participants accept A-RCs with resumptive pronouns, but reject S and O-RCs with resumptive pronouns?

To this end, participants were presented with a series of sentences and asked to rate the grammaticality of each sentence on a five point Likert scale. There were 6 test sentence types that were presented as a part of this task: each RC type (S, A, and O), with and without a resumptive pronoun. An example of each type can be seen in Table 6.9.

Table 6.9. Examples of Judgement Task Test Items

	Without Resumptive Prn	**With Resumptive Prn**
S	*le teine [ʻoloʻo ʻata]* the girl PROG laugh ʻthe girl that is laughing'	**le teine [ʻoloʻo ia ʻata]* the girl PROG 3S laugh ʻthe girl that is laughing'
O	*le teine [ʻoloʻo siʻi e le tama]* the girl PROG lift ERG the boy ʻthe girl that the boy is lifting'	**le teine [ʻoloʻo ia siʻi e le tama]* the girl PROG 3S lift ERG the boy ʻthe girl that the boy is lifting'
A	*le teine [ʻoloʻo tosoina le tama]* the girl PROG pull.*ina* the boy ʻthe girl that is pulling the boy'	*le teine [ʻoloʻo ia tosoina le tama]* the girl PROG 3S pull.*ina* the boy ʻthe girl that is pulling the boy'

There were four tokens of each type, for a total of 24 test items. Also included were 24 filler items. These consisted of three types of declarative sentences: canonical declaratives, quantified declaratives, and declaratives using clitic pronouns. These fillers were selected as controls to ensure the validity of the test item responses, as well as to obscure the target structures fom the participants themselves. Canoncial declaratives were chosen as the most basic items to ensure participants were sensitive to VS/VAO word order. Quantified declaratives were included as a slightly more complex, yet still fundamental, variation of canonical declaratives, where a numerical quantity occurred modifying a core argument. Finally, declaratives using clitic pronouns were included where participant responses would reveal sensitivity to core arguments occuring as clitic pronouns in constructions other than relative clauses. A grammatical and ungrammatical version of each type was included in the task. Each

of these filler types were included as constructions without any direct involvement with ergativity. An example of each is presented in Table 6.10. With both test and filler items combined, the task consisted of a total of 48 items.

Table 6.10. Examples of Judgement Task Filler Items

	Grammatical	**Ungramamtical**
Cann.	*E poto tele le tama lea.* PRS smart very the boy this 'This boy is very smart.'	**'Ua pē le tuai ta'avale lea.* PRF die the old car this 'This old car has died.'
Quant.	*Sā va'ai le teine 'i le ta'avale e tasi.* PRS see the girl OBL the car PRS one 'The girl saw one car.'	**E mana'o le tama 'i tolu tusi.* PRS want the boy OBL three book 'The boy wants three books.'
Cl. Prn.	*'E te fiafia e faitau tusi.* 2S PRS like PRS read book 'You like to read books.'	**'Ua ia nofo i luga o le ta'avale.* PRF 3S sit on top of the car 'S/he has sat on top of the car.'

Test and filler items were presented together. The order in which they were presented was randomized using Excel. Items were read aloud individually to the participant. After each item was read, the participant rated the grammaticality of the sentence by circling the appropriate number on the judgement task form.

6.3.2.2 Intervention Tasks

Folowing the pretests, all participants, except for those in the control group who did not receive any intervention, were taken through one of two intervention tasks. Those participants in the morphological group were given Task 1: Declarative Intervention, while those in the syntactic group were given Task 2: *Wh*-Question Intervention (Table 6.11).

Table 6.11. Session I: Intervention

1) **Control Group:** None
2) **Morphological Group:** Declarative Intervention Task
3) **Syntactic Group:** *Wh*-Question Intervention Task

Both intervention tasks are detailed in the following sections.

6.3.2.2.1 Task 1: Declarative Intervention

The Declarative Intervention Task was structured in the same way as the Declarative Production Task with explicit intervention by the researcher to ensure the production of the morphological ergativity in order to train the participant on the appropriate use of the ergative case. There were a total of 5 intransitive items, and 5 transitive items. An example of each is presented in Figure 6.4.

Figure 6.4. Sample of intransitive and transitive pictures for intervention

a) Intransitive Item b) Transitive Item

All items depicted animate characters. A total of 5 intransitive verbs were used (*siva* 'dance', *oso* 'jump', *pa'ū* 'fall', *tamo'e* 'run', *tū* 'stand'), along with 5 transitive verbs (*toso* 'pull', *si'i* 'lift', *fa'asusū* 'spray', *kiki* 'kick', *fusi* 'hug'). The full set of items can be seen in Appendix C.

The task began with explicit modeling of declarative sentences by the researcher to the participant. The participant was presented with an intransitive item first. The researcher then modeled the appropriate description of that item by producing an intransitive declarative sentence (i.e. VS with no ergative case marker). The participant was then shown a transitive item. The researcher again modeled the appropriate description of the item by producing a transitive declarative sentence with the necessary ergative features (i.e. VAO with the ergative

case marker). The protocol for this intervention technique is presented in Table 6.12. The prompts were given in English, and the modeled response was given in Samoan.

Table 6.12. Declarative Intervention Protocol: Explicit Modeling

(a)	*-- The particiant is shown an intransitive item. --*	
Reasearcher:	To describe this item, you would say, "*'Olo'o siva le teine.*" PROG dance the girl 'The girl is dancing.'	
(b)	*-- The particiant is then shown a transitive item. --*	
Reasearcher:	To describe this item, you would say, "*'Olo'o toso e le teine le tama.*" PROG pull ERG the girl the boy 'The girl is pulling the boy.'	

Following the explicit modeling, the participant was then taken through each task item. In the same way as the Declarative Production Task, participants were given the first portion of a declarative sentence by the researcher (i.e. TAM and verb). They were then tasked with completing the sentence (i.e. verbal arguments). The intransitive items were presented first, followed by the transitive items. If the participant produced the description of the item without the appropriate ergative features (i.e. ergative case), the researcher would then recast the description with prosodic emphasis on the previously missed ergative feature. The participant was then asked to imitate the researcher's recast. An example of the protocol for the transitive item presented in Figure 5.4(b) is given here in Table 6.12 (R: Researcher, P: Participant).

Table 6.12. Declarative Intervention Protocol: Recast

-- The particiant is shown the transitive item. Researcher prompts, participant responds. --

	'Olo'o toso...		*'Olo'o toso le teine le tama.*
R:	PROG pull	P:	PROG pull the girl the boy
	'Pulling...'		*'The girl is pulling the boy.'

-- The researcher recasts with ergative case. The participant imitates recast. --

	'Olo'o toso ***e*** *le teine le tama.*		*'Olo'o toso* ***e*** *le teine le tama.*
R:	PROG pull **ERG** the girl the boy	P:	PROG pull **ERG** the girl the boy
	'The girl is pulling the boy.'		'The girl is pulling the boy.'

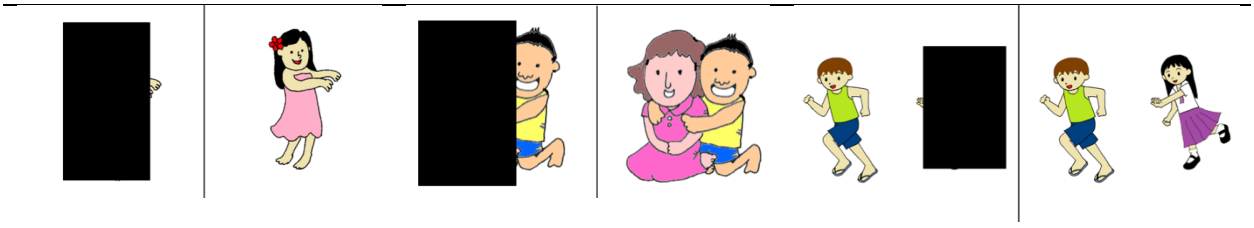
Through the use of both explicit modeling and recasting, the objective was for the participant to be aware of morphological ergativity (i.e. case) and its use in transitive declarative sentences, to utlimately produce ergative case in declarative sentences without any need for assistance. This task was only administered to the participants in the morphological group.

6.3.2.2.2 Task 2: *Wh*-Question Intervention Task

The *Wh*-Question Intervention Task was the second of the intervention tasks, and it was structured in the same way as the *Wh*-Question Production Task with an additional intervention component to ensure the production of syntactic ergativity in order to train the participant on the appropriate use of the transitive suffix *–ina*, as well as the ergative case marker in *wh*-questions. There were a total of 5 S-WhQ items, 5 O-WhQ items, and 5 A-WhQ items. An example of each is presented in Figure 6.5.

Figure 6.5. Sample items from the *Wh*-Question Production Task

a) S-WhQ Item b) O-WhQ Item c) A-WhQ Item

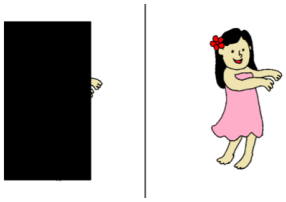
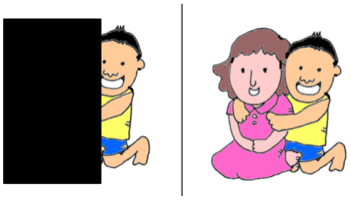
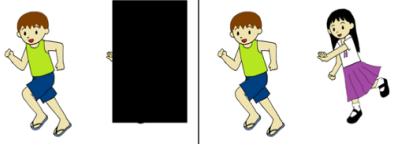


All items depicted animate characters. A total of 5 intransitive verbs were used for the S-items (*tagi* 'cry', *tamo'e* 'run', *'ata* 'laugh', *nofo* 'sit', *tā'ele* 'bathe'), along with 10 transitive

verbs for the O and A items, respectively (O: *ʻini* ʻpinch', *tāofi* ʻstop', *ʻotegia* ʻscold', *tūlei* ʻpush', *lagona* ʻhear'; A: *siʻi* ʻlift', *tūlei* ʻpush', *faʻasusū* ʻspray', *fusi* ʻhug', *tuli* ʻchase'). The full set of items can be seen in Appendix D.

The task began with explicit modeling. As in declarative intervention, the participant was shown an example of each item type (S, O, and A). The researcher then modeled the appropriate description for each item with the relevant ergative features. The protocol for this portion of the task is presented in Table 6.13.

Table 6.13. *Wh*-Question Intervention Protocol: Explicit Modeling

(a)	*-- The particiant is shown an S-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*ʻO ai ʻoloʻo siva?* PRD who PROG dance ʻWho is dancing?'	
(b)	*-- The particiant is then shown an O-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*ʻO ai ʻoloʻo fusi e le tama?*" PRD who PROG hug ERG the boy ʻWho is the boy hugging?'	
(c)	*-- The particiant is then shown an A-WhQ item. --*	
Reasearcher:	To describe this item, you would ask, "*ʻO ai ʻoloʻo tuliina le tama?*" PRD who PROG chase.*ina* the boy ʻWho is chasing the boy?'	

Task items were presented individually to each participant. Participants were first shown the picture with part of the image blocked out by a black rectangle. The researcher then gave the participants the following prompt to elicit a *wh*-question: "Someone is doing something. Ask me who." The exact form of the prompt depended upon the item type (S, A, or O), and the action depicted in the picture. An example of each prompt type is given in Table 6.13. The S items were presented first, followed by the O items, and then the A items.

Following the explicit modeling, the participant was then taken through each task item. In the same way as the *Wh*-Question Production Task, participants were first the item with a

portion of the picture blocked out by a black rectangle. They were then told, "Someone is doing something, ask me who." The participant would then respond with a *wh*-question. The S-WhQ items were presented first, followed by the O-WhQ and the A-WhQ items. If the participants produced a *wh*-questions without the appropriate ergative features (i.e. *–ina,* ergative case), the researcher would then recast the question with prosodic emphasis on the previously missed feature. The participant was then asked to imitate the researcher's recast. An example of the protocol for the O and A items are presented in Table 6.14 (R: Researcher, P: Participant).

Table 6.14. *Wh*-Question Intervention Protocol: Recast

(a) *-- The particiant is shown an O-WhQ item. Researcher prompts, participant responds. --*

'Olo'o fusi e le tama se isi. Fesili mai po 'o ai.

R: PROG hug ERG the boy a other ask DIR PRT PRD who

'The boy is hugging someone. Ask me who.'

'O ai 'olo'o fusi le tama?"

P: PRD who PROG hug the boy

*'Who is the boy hugging?'

-- The researcher recasts with ergative case. The participant imitates recast. --

*'O ai 'olo'o fusi **e** le tama?"*

R: PRD who PROG hug **ERG** the boy

'Who is the boy hugging?'

*'O ai 'olo'o fusi **e** le tama?"*

P: PRD who PROG hug **ERG** the boy

'Who is the boy hugging?'

(b) *-- The particiant is shown an A-WhQ item. Researcher prompts, participant responds. --*

'Olo'o tuli e se isi le tama. Fesili mai po 'o ai.

R: PROG pull ERG a other the boy ask DIR PRT PRD who

'Someone is chasing the boy. Ask me who.'

'O ai 'olo'o tuli le tama?"

P: PRD who PROG chase the boy

*'Who is chasing the boy?'

-- The researcher recasts with ergative case. The participant imitates recast. --

*'O ai 'olo'o tuli**ina** le tama?"*

R: PRD who PROG hug.**ina** the boy

'Who is the boy hugging?'

*'O ai 'olo'o tuli**ina** le tama?"*

P: PRD who PROG hug.**ina** the boy

'Who is the boy hugging?'

The objective of explicit modeling and recasting in this task was to make the participant aware of syntactic ergativity (i.e. transitive suffix *-ina*) and its use in *wh*-questions with the ultimate goal of participants producing these ergative features without need for intervention. This task was only administered to the participants in the syntactic group.

6.3.2.3 Post-Tests: Declarative and *Wh*-Question Production

Following the intervention task, all participants were taken through two post-tests. The purpose of these post-tests was to measure any increase from the pretest in the use of ergative features as an effect of the intervention. The post-tests consisted of two of the same tasks adminstered in the pretest, but with different items. The first was the Declarative Sentence Completion Task and the second was the *Wh*-Question Production Task (Table 6.15).

Table 6.15. Session I: Immediate Post-test

1) Declarative Sentence Completion Task
2) Wh-Question Production Task

Participants were taken through these tasks twice, once immediately following the intervention in the Immediate Post-test to measure any initial increase in ergativity, and again two to three weeks later in the Delayed Post-test to see whether any initial increase had been maintained (Table 6.16).

Table 6.16. Session II: Delayed Post-test (2 – 3wks later)

1) Declarative Sentence Completion Task
2) Wh-Question Production Task

Each time the task was administered new items were used.

6.3.2.4 Extension Tests: Relative Clause Production and Resumptive Pronoun Judgement

After participants completed the post-tests, they were then taken through two extenstion tests. These were again two of the same tasks given in the pretest, however, for these constructions, the participants were not given any form of intervention. The purpose of these tasks, then, was to investigate whether participants might extend the use of ergative features beyond the constructions given in the intervention. This would indicate a more general pattern of ergativity.

The first task given as a part of the extension test was the Relative Clause Production Task. This was the same task from the pretest with new items. The second task was the Resumptive Pronoun Judgement Task. Again, this was the same used from the pretest, however, with all new items (Table 6.17).

Table 6.17. Session II: Extenstion Test

1) Relative Clause Production Task
2) Resumptive Pronoun Judgement Task

This concluded the elicitation sessions.

6.2.3 Procedure

As outlined in the previous sections, all six elicitation tasks were strategically organized to address each of the research questions. Elicitation took place over the course of two separate sessions. Each session was divided into specific units, each consisting of a particular set of eliciation tasks. In Session I, participants were first taken through a series of pretests. This consisted of Declarative Production, Wh-Question Production, Relative Clause Production, and Resumptive Pronoun Judgement. Following the pretests, participants were taken through an intervention task. The type of intervention participants received depended upon their participant group. Of the 45 total participants, 15 were given no intervention at all as the control group, 15 were given the Delcarative Intervention Task as the morphological group, and 15 were given the *Wh*-Question Intervention Task as the syntactic group. Upon completion of the intervention, all

participants were given an immediate post-test, which consisted of both the Declarative Production and *Wh*-Question Production Tasks. These were the same tasks as before with different items. This concluded Session I.

Session II took place 2 – 3 weeks after Session I. In this session, participants were taken through a delayed post-test, which consisted again of Declarative and *Wh*-Question Production tasks with different items from before. Following the delayed post-test, participants were given an extension test. This consisted of a Relative Clause Production Task and a Resumptive Pronoun Judgement Task, again same tasks as the pretest, but with different items. This concluded Session II.

The full breakdown of the timeline for both sessions, as well as the elicitation tasks contained within and participant group, is presented in the following tables. Table 5.20 presents the order of tasks for the control group.

Table 6.18. Timeline of Elicitation Sessions: *Control Group*

SESSION I:			**SESSION II:**	
			(2 – 3 wk Interval)	
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	NONE	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

Table 5.21 and Table 5.22 present the timeline for the morphological and syntactic groups, respectively.

Table 6.19. Timeline of Elicitation Sessions: *Morphological Group*

SESSION I:	**SESSION II:**
(2 – 3 wk Interval)	

Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	DECLARATIVES	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

Table 6.20. Timeline of Elicitation Sessions: *Syntactic Group*

SESSION I:			**SESSION II:**	
		(2 – 3 wk Interval)		
Pretest:	**Intervention:**	**Immediate Post-test:**	**Delayed Post-test:**	**Extension Test:**
Declaratives		Declaratives	Declaratives	Relative Clauses
Wh-Questions	WH-QUESTIONS	Wh-Questions	Wh-Questions	Resmpt. Prns.
Relative Clauses				
Resmpt. Prns.				

6.3.4 Predictions

In the prestest, participants were expected to produce a minimum of ergative features across all elicitation tasks given what has been observed in the previous Samoan SLA study (Muāgututi'a 2010). The remaining tests after the intervention, however, have no precedent. If the intervention has an effect, there should be a significant increase in the production of ergative features in immediate post-test. However, the breadth of recovery should depend on i) the type of intervention the participant received, given the result from heritage speakers, and ii) the nature of L2 acquisition.

The type of intervention should dictate the extent of ergative features gained post-intervention. Those in the syntactic group, who receive *wh*-question intervention, should experience the most robust increase in ergative features, both morphological and syntactic. There should at least be an increase in ergative case in O-WhQs and the transitive suffix *–ina* in A-WhQs, perhaps an extension to declaratives and relative clauses. Those in the morphological

group, who receive declarative intervention, should experience in increase in morphological features only, that is, the use of ergative case in transitive declaratives and perhaps *wh*-questions and relative clauses. Those in the control group, however, who receive no intervention at all, are expected to show no increase in ergative features whatsoever.

As for the extension of ergative features to constructions not included in the intervention, this would be heavily dependent upon the nature of L2 acquisition. If L2 learners are able to use the cues given in the intervention tasks to extrapolate a more general pattern of ergativity accross a range of structures and apply key features accordingly, this would correspond to the same level of recovery observed amongst heritage speakers. Such a result would suggest that heritage recovery is indeed a result of recent acquisition, and not a result of reactivated latent knowledge (i.e. Contigency Hypothesis). On the other hand, if L2 learners are unable to achieve an extension of ergative features comparable to that of heritage speakers (i.e. structure-specific increase as opposed to a general pattern), this would suggest that heritage speakers may be benefiting from something other than standard L2 acquisition, perhaps residual, implicit knowledge originally acquired during critical learning periods in childhood (i.e. Permanence Hypothesis).

These predictions are examined in detail in the following sections where the analysis, results, and dicussion are presented.

6.3.5 Analysis

All participant responses were audio recorded and later transcribed. Responses were coded for the use of the ergative case marker, as well as the transitive suffix *–ina*. The results for all tasks are presented in the following section.

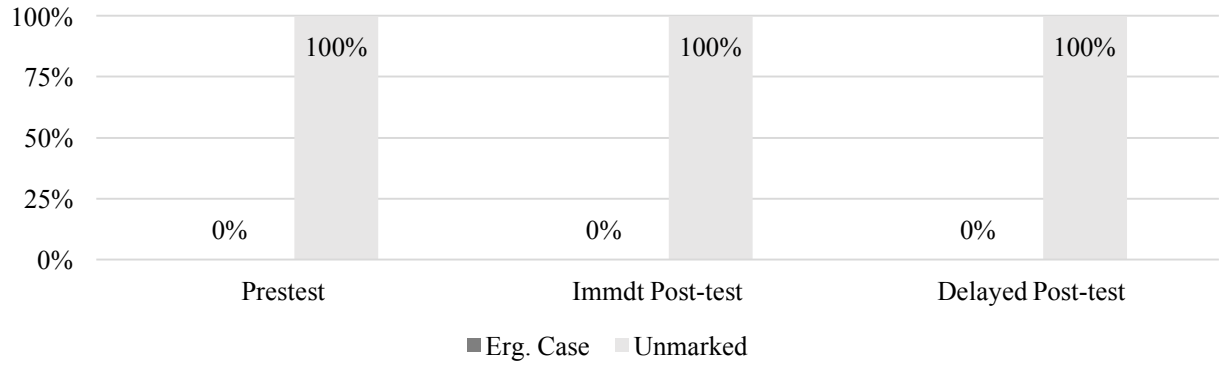
6.3.6 Results

The results for each participant group and each session are presented in the following three sub-sections. The Declarative and *Wh*-Question results are displayed first, followed by the Relative Clause results.

6.3.6.1 L2 Control Group

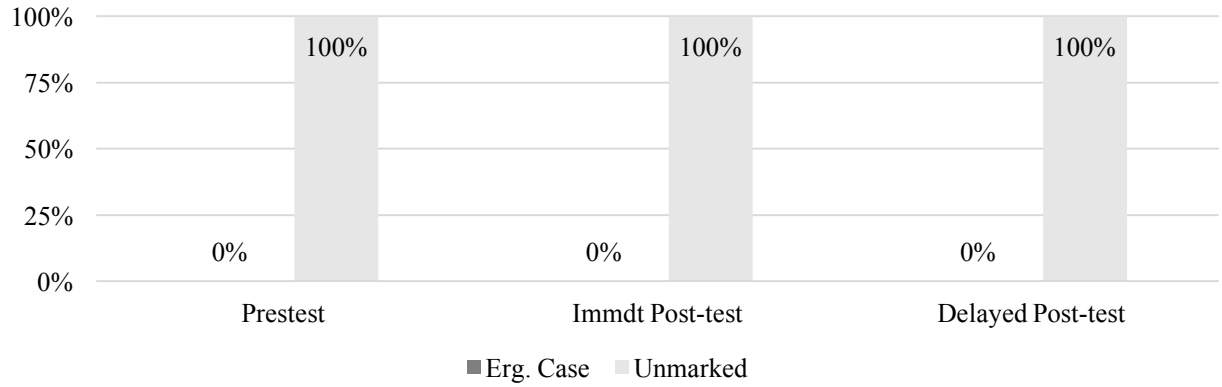
Presented in Figure 6.6 are the results from the Declarative Production Task across all three tests. Displayed are the rates at which participants produced the ergative case in transitive declaratives. The control group showed no production of ergative case in the pretest, and as expected, showed no improvement in both the immediate and delayed post-tests.

Figure 6.6. L2 Control Group: Transitive Declarative Results (Erg. Case)



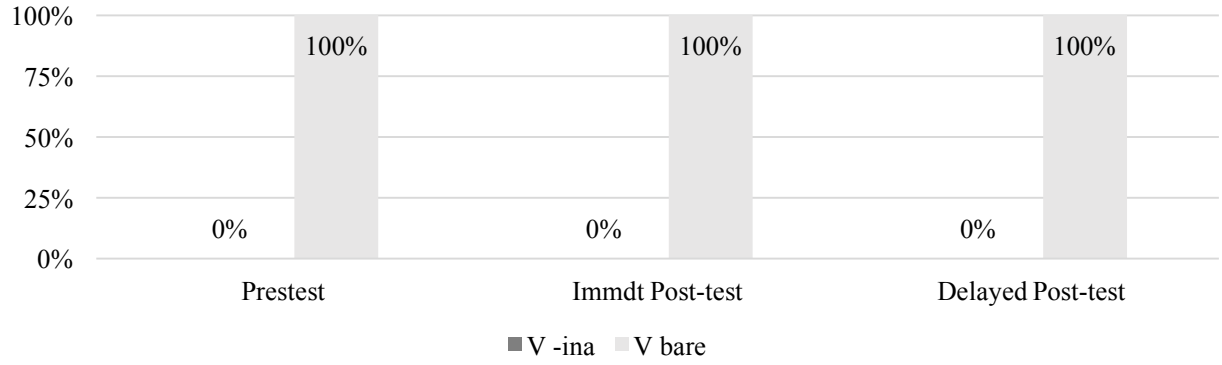
A similar result was observed in the *Wh*-Production Task. Presented in Figure 6.7 are the results for the production of ergative case in O-WhQs. Participants did not produce any ergative case in the pretest, nor did they produce the case marker in the immediate and delayed post-tests. This is again an expected result.

Figure 6.7. L2 Control Group: O-WhQs Results (Erg. Case)



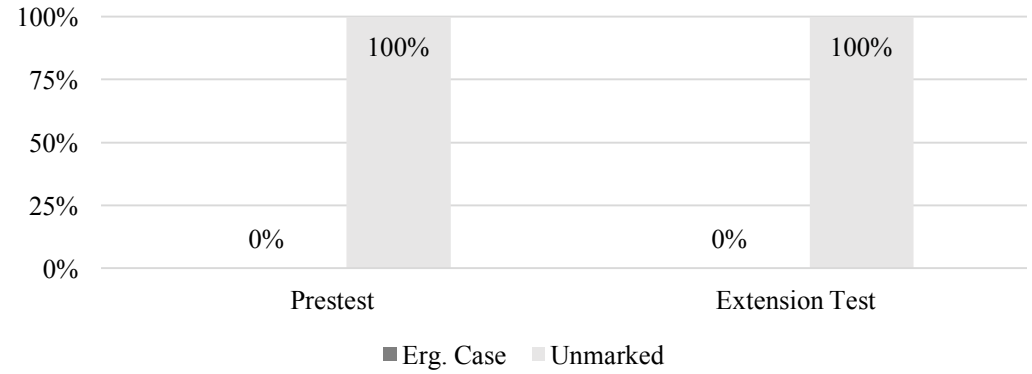
As far as the production of the transitive suffix *–ina*, an expected result was once again observed. Presented in Figure 6.8 are the rates that *–ina* was produced in A-WhQs across all three tests. The transitive suffix was never produced (0%) in the pretest, and there was no increase in the immediate or delayed post-tests.

Figure 6.8. L2 Control Group: A-WhQs Results *(-ina)*



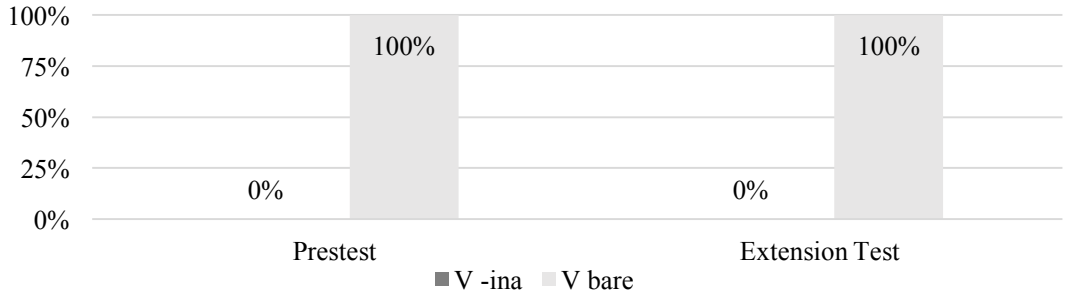
The Relative Clause Production Task saw the same results. In both the pretest and the extension test, the ergative case was never produced in O-RCs (Figure 6.9).

Figure 6.9. L2 Control Group: O-RCs Results (Erg. Case)



Similarly, the transitive suffix *–ina* was never produced in A-RCs across both the pretest and extension test (Figure 6.10).

Figure 6.10. Control Group: A-RCs Results (*-ina*)



Key Results from L2 Control Group:

The results observed here for the control group are as expected given the fact that participants did not receive any intervention. A summary of key findings from each task are presented below, and compared with the results observed from the heritage speaker group (C = Control Group).

Table 6.21. Key Results from Declarative Production

		PRETST	IMMDT	DELYD
Group	**Qty**	**Erg. Case**	**Erg. Case**	**Erg. Case**
L2.C	10	0%	0%	0%
Heritage.C	15	0%	0%	0%

Table 6.22. Key Results from Wh-Question Production

Group	Qty	PRETST O-WhQs: Erg.Case	IMMDT O-WhQs: Erg.Case	DELYD O-WhQs: Erg.Case	PRETST A-WhQs: *-ina*	IMMDT A-WhQs: *-ina*	DELYD A-WhQs: *-ina*
L2.C	10	0%	0%	0%	0%	0%	0%
Heritage.C	15	0%	0%	0%	4%	4%	4%

Table 6.23. Key Results from Relative Clause Production

Group	Qty	PRETST O-RCs: Erg. Case	EXTN O-RCs: Erg. Case	PRETST A-RCs: *-ina*	EXTN A-RCs: *-ina*
L2.C	10	0%	0%	0%	0%
Heritage.C	15	0%	0%	0%	0%

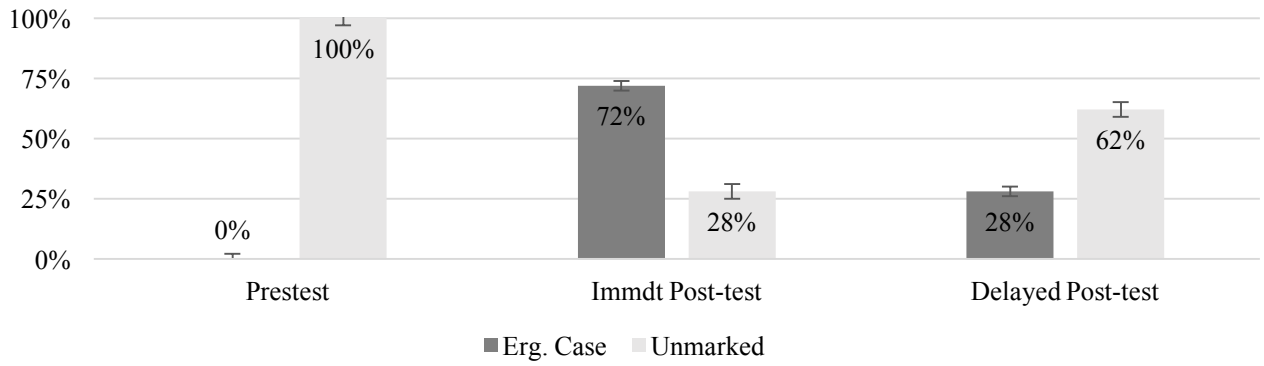
Parallel results were observed for both control groups (i.e. heritage and L2) in that no increase in ergativity was observed. This further supports the necessity of the intervention tasks to induce ergative features that were intially lacking. The next section presents the results for the morphological group.

6.3.6.2 Morphological Group

The morphological group are those participants that were given the Declarative Intervention Task. Figure 6.11 presents the results from the Declarative Production Task for the transitive declarative items across the three tests. The pretest showed a complete lack of the ergative case marker at a 0% production rate. However, following the intervention, a significant increase was observed where the ergative case was produced at a rate of 72% in the immediate post-test. After the 2-3 week interval, however, the production of ergative case dropped considerably to 28%. While these results show a significant effect of the Declarative Intervention Task in the

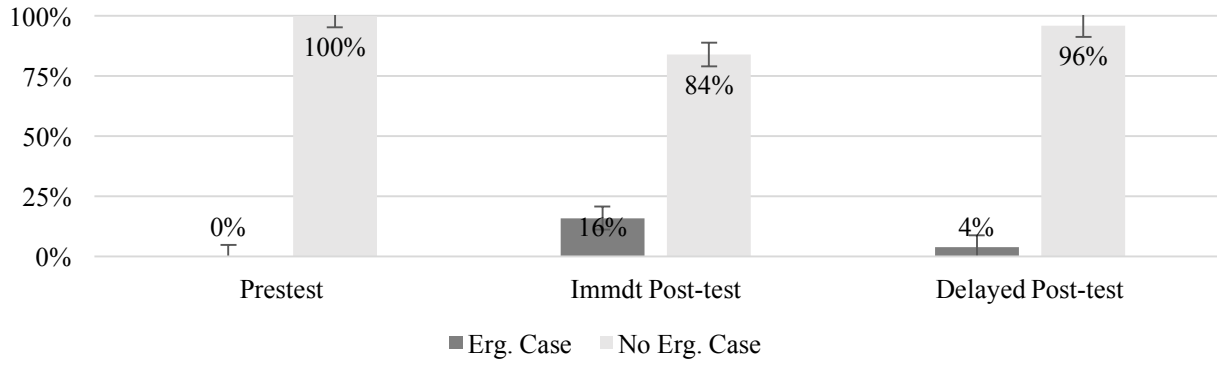
use of the ergative case in transitive declarative production, it also demonstrates a rather high attrition rate.

Figure 6.11. L2 Morphological Group: Trans. Declarative Results (Erg Case)



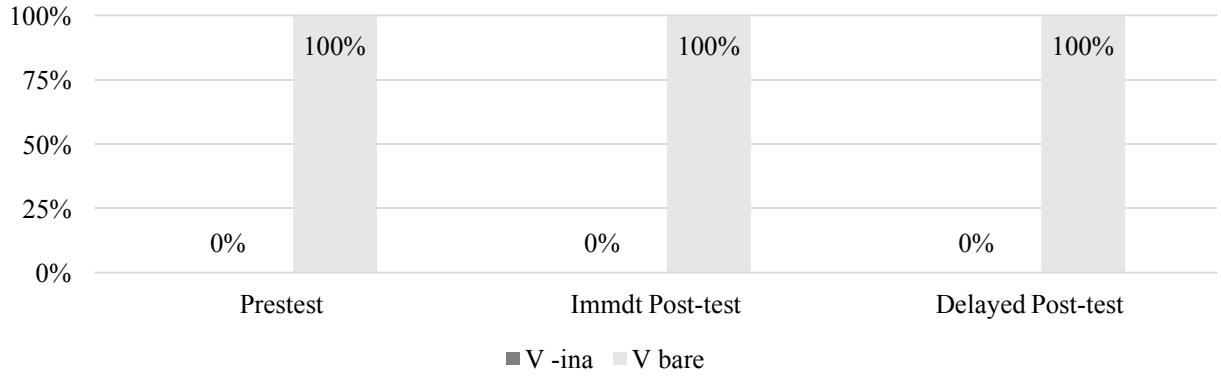
An increase in the production of ergative case was also observed in O-WhQs, a construction participants were not trained in. While the pretest showed no signs of ergative case in O-WhQs, the immediate post-test showed a significant increase to a rate of 16%. 2-3 weeks later, however, the delayed post-test showed a very low rate of 4%. This result suggests that although the ergative case marker was extended to *wh*-questions, the effect may be short-lived (less than 3 weeks). It is important to note that the L2 participants, like their heritage counterparts, crucially did not overgeneralize the ergative case marker to S or A-WhQs. They reserved its use only to mark A arguments in O-WhQs.

Figure 6.12. L2 Morphological Group: O-WhQs Results (Erg Case)



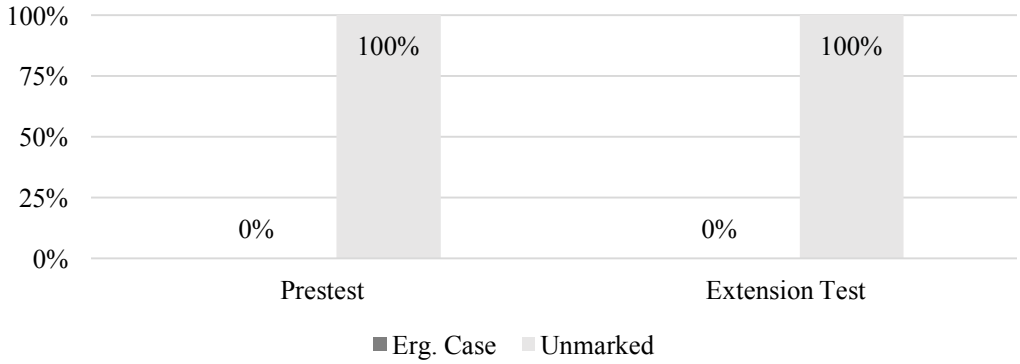
The production of the transitive suffix *–ina* in A-WhQs (Figure 6.13) did not increase. The pretest showed that *–ina* was never produced. The immediate and delayed post-tests showed the same results. This lack of increase in production rate is expected, given the fact that participants were never trained in the use of the transitive suffix.

Figure 6.13. L2 Morphological Group: A-WhQs Results *(-ina)*



Relative Clause Production showed a similar result. The ergative case marker never ocurred in the pretest (0%), nor did it occur in the extension test. While some extension was observed in O-WhQs, O-RCs did not receive the same consideration. This suggests that participants treated *wh*-questions and relative clauses as distinct structures accross which they should not generalize grammatical features.

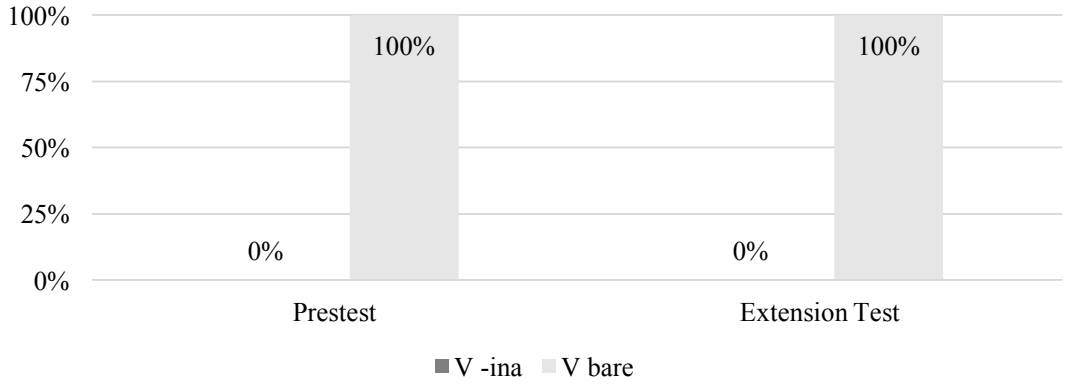
Figure 6.14. L2 Morphological Group: O-RCs Results (Erg. Case)



A parallel result was observed in A-RCs. The use of the transitive suffix *–ina* never ocurred in either the pretest or the extension test. This, however, is expected given that

participants were never trained in the use of the suffix for either relative clauses or *wh*-questions. These results can be seen in Figure 6.15.

Figure 6.15. L2 Morphological Group: A-RCs Results (*-ina*)



Key Results from L2 Morphological Group:

The results from the morphological group has shown that declarative intervention is indeed effective in increasing the ergative case marker in transitive declaratives. It also shows, however, that this increase may be short-lived, as the retention rate in the delayed post-test were considerably low. Moreover, the increase in ergative case was only extended (at a low rate) to *wh*-questions, but not at all to relative clasues. This suggests that although morphologically ergative features have been extrapolated from the intervention, a more general pattern of morphological ergativity has not.

Syntactically ergative features also seem to have alluded participants, but this was expected due to the fact that participants received no training in syntactic ergativity. A summary of key results from the L2 morphological group are presented below with comparison to the heritage morphological group (M = morphological).

Table 6.24. Key Results from Declarative Production

		PRETST	IMMDT	DELYD
Group	**Qty**	**Erg. Case**	**Erg. Case**	**Erg. Case**
L2.M	10	0%	72%	24%
Heritage.M	15	0%	84%	71%

Table 6.25. Key Results from *Wh*-Question Production

Group	Qty	PRETST O-WhQs: Erg.Case	IMMDT O-WhQs: Erg.Case	DELYD O-WhQs: Erg.Case	PRETST A-WhQs: *-ina*	IMMDT A-WhQs: *-ina*	DELYD A-WhQs: *-ina*
L2.M	10	0%	16%	4%	0%	0%	0%
Heritage.M	15	0%	21%	20%	6%	7%	7%

Table 6.26. Key Results from Relative Clause Production

Group	Qty	PRETST O-RCs: Erg. Case	EXTN O-RCs: Erg. Case	PRETST A-RCs: *-ina*	EXTN A-RCs: *-ina*
L2.M	10	0%	0%	0%	0%
Heritage.M	15	0%	19%	0%	0%

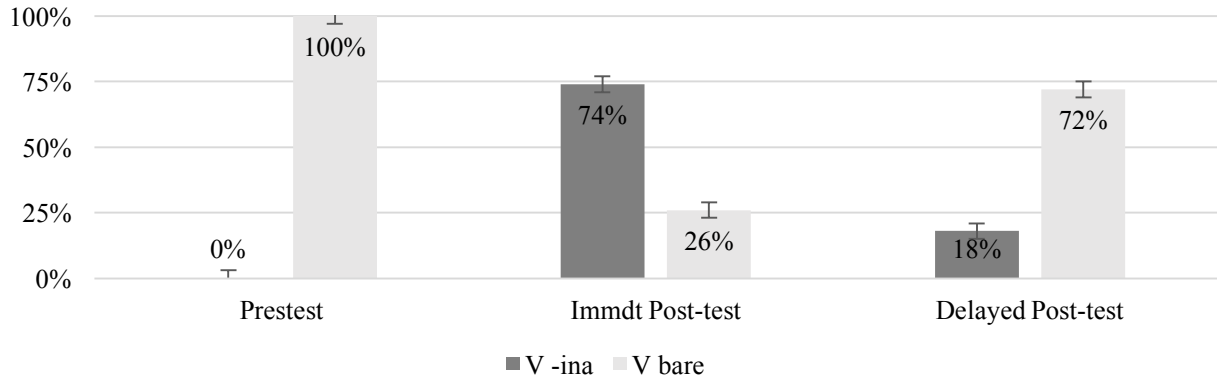
A comparison of the L2 morphological results with those of the heritage group demonstrates higher, more durable rates of increase in the heritage group, as well as greater extension of ergative features. While neither showed improvement in syntactic ergativity, as expected, the L2 group appeared much more reluctant to confer newly acquired morphologically ergative features to structures outside the scope of the intervention task. The heritage group, however, extended more freely to other constructions. It is peculiar the L2 participants only extended from declaratives to *wh*-questions, but not relative clauses; however, this could be due in part to the fact that the declarative and *wh*-question post-tests were presented in the same session as the intervention, whereas the relative clause extension-test was presented in a separate session (i.e. Session II). This further confirms the fragility of the newly acquired ergative features in L2 participants, as opposed to their heritage counterparts.

The next section expands on these observations by presenting the results observed from the syntactic group who were given the *Wh*-Question Intervention Task.

6.3.6.3 Syntactic Group

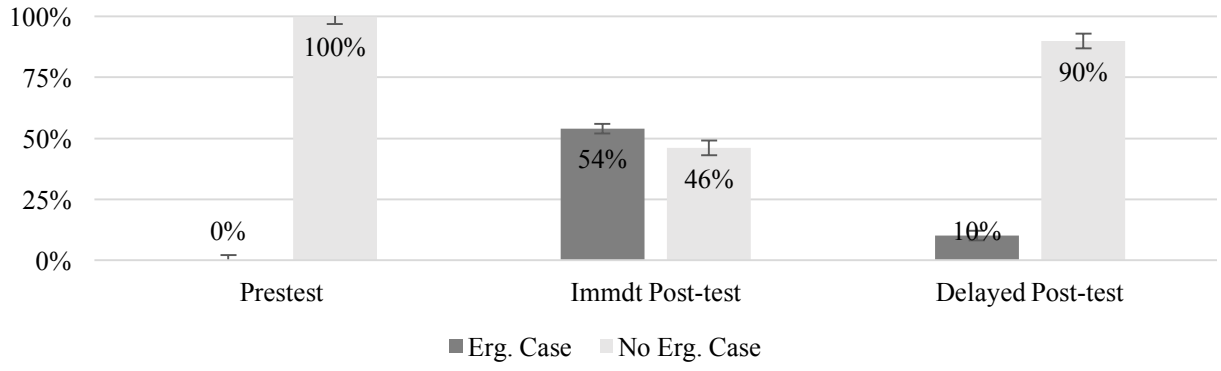
For the syntactic group, the *wh*-question results are presented first, for which they received an intervention, followed by the declarative and relative clause results, for which no intervention was received. Figure 6.16 displays the results for A-WhQs across all three tests. The pretest showed that the *–ina* suffix was never produced, following the intervention, however, production of *–ina* increased to 74%. After the 2-3 week interval, *-ina* decreased to a rate of 18%.

Figure 6.16. L2 Syntactic Group: A-WhQs Results *(-ina)*



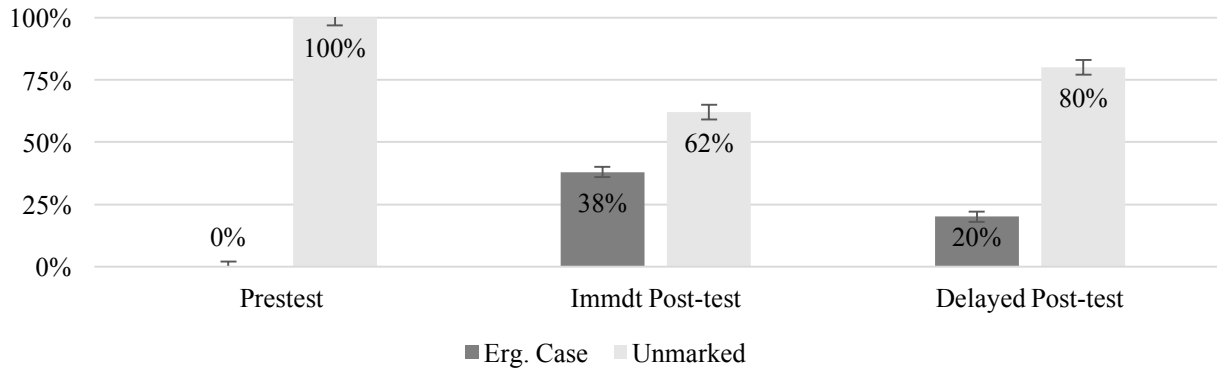
For O-WhQs (Fig. 6.17), the ergative case was never produced in the pretest. However, in the immediate post-test, use of the ergative case increased to 54%, but decreased to a rate of 10% in the delayed post-test.

Figure 6.17. L2 Syntactic Group: O-WhQs Results (Erg. Case)



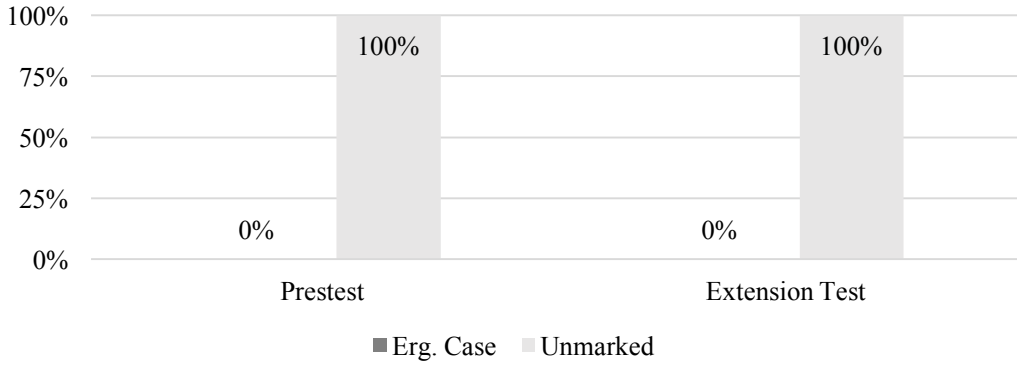
These results show that the *Wh*-Question Intervention Task did result in an increase in ergative features in *wh*-questions. The results from the declarative production task, for which no intervention was given, shows an extension of the ergative case to transitive declaratives at a rate of 38% in the immediate post-test and 20% in the delayed post-test (Fig. 6.18). This is a noticeable increase given that the ergative case never occurred in the pretest.

Figure 6.18. L2 Syntactic Group: Trans. Declarative Results (Erg Case)



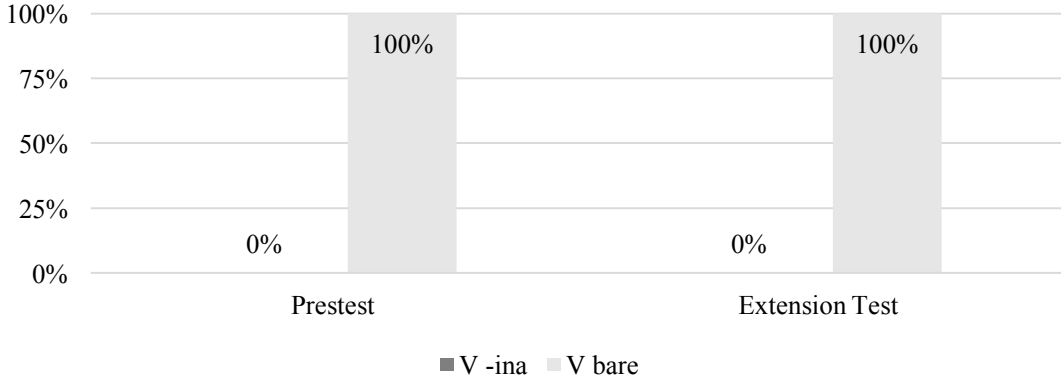
However, the ergative case was not extended to relative clauses. Ergative case was absent in the pretest and the extension test, suggesting a more general pattern of morphological ergativity was not acquired.

Figure 6.19. L2 Syntactic Group: O-RCs Results (Erg. Case)



The result from A-RCs corroborate this idea by showing that the transtitive suffix *–ina* was not extended to relative clauses either. This suggests that a more general pattern of syntactic ergativity was not acquired, in spite of the fact that *–ina* was extended to some degree to *wh*-questions.

Figure 6.20. L2 Syntactic Group: A-RCs Results (*-ina*)



Key Results from L2 Syntactic Group:

The results observed here from the L2 syntactic group demonstrate significant effects from the *Wh*-Question Intervention Task. However, from these cues, evidence suggests that participants fell short of a consistent pattern of morphological and syntactic ergativity. The ergative case marker (i.e. morphological) was only produced in *wh*-questions and to some extent declaratives, but not extended to relative clauses. Similarly, the transitive suffix *–ina* (i.e. syntactic) saw an increase in *wh*-questions, but were not extended to relative clauses. This result diverges from the results observed with heritage speakers. A summary of key results for both L2 and heritage syntactic groups are presented in the tables below for comparison (S = syntactic).

Table 6.27. Key Results from *Wh*-Question Production

Group	Qty	PRETST O-WhQs: Erg.Case	IMMDT O-WhQs: Erg.Case	DELYD O-WhQs: Erg.Case	PRETST A-WhQs: *-ina*	IMMDT A-WhQs: *-ina*	DELYD A-WhQs: *-ina*
L2.S	10	0%	54%	10%	0%	74%	18%
Heritage.S	15	0%	88%	61%	1%	91%	74%

Table 6.28. Key Results from Declarative Production

Group	Qty	PRETST Erg. Case	IMMDT Erg. Case	DELYD Erg. Case
L2.S	10	0%	38%	20%
Heritage.S	15	0%	53%	33%

Table 6.29. Key Results from Relative Clause Production

Group	Qty	PRETST O-RCs: Erg. Case	EXTN O-RCs: Erg. Case	PRETST A-RCs: *-ina*	EXTN A-RCs: *-ina*
L2.S	10	0%	0%	0%	0%
Heritage.S	15	0%	56%	0%	52%

The comparison of the L2 syntactic results with those of their heritage counterparts demonstrates higher, more durable rates of increase in the heritage group, as well as greater extension of ergative features. While both showed improvement in syntactic ergativity, the L2 group showed significantly lower rates of increase, as well as higher rates of attrition. They also failed to demonstrate a more general application of ergative features accross structures (i.e. lack of extension to relative clauses). The heritage group, however, extended ergative features to all constructions, including resumptive pronouns, a phenomenon they were never trained in. L2 participants only extended from *wh*-questions to declaratives, but not relative clauses. This results was also seen in the morphological group, further suggesting that extension occurred due to the fact that the declarative and *wh*-question post-tests were presented in the same session as the intervention, whereas the relative clause extension-test was presented in a separate session (i.e. Session II). This lends additional evidence as to the fragility of the newly acquired ergative features in L2 participants, a characteristic absent in heritage participants.

The implications of these results, as well the results observed in the control and morphological groups for both L2 and heritage speakers are explored in detail in the following section.

6.3.7 Discussion

The L2 results in the prestest were as expected.[5] There were no signs of any ergative feature in any construction, very similar to what was observed in the heritage experiment. However, the subsequent L2 results diverged from heritage speakers in two crucial ways. The first was the rate of increase and retention of ergative features post-intervention, and the second was the breadth to which ergative features were extended across structures. Each of these are addressed here.

While a significant increase was observed in the L2 immediate post-tests, they were at a substantially lower rate than that of heritage speakers. In addition, the delayed post-test showed a considerable drop in ergative features, demonstrating a much higher rate of attrition than in the heritage experiment. This demonstrates that although L2 speakers were able to achieve a higher rate of ergative features following the intervention, they were unable to outperform their heritage counterparts, suggesting perhaps that heritage speakers may be more sensitive to ergativity.

A similar result was observed in the extension of ergative features to structures not included in the intervention. While L2 learners were able to extend the ergative case between declaratives and *wh*-questions, they did not extend to relative clauses. This demonstrates that L2 participants did not establish a more general pattern of ergativity in the same way as the heritage speakers. It appears that they were able to extend features between declaratives and *wh*-questions perhaps because both tasks were administered in the same session following the intervention. However, it is clear that these participants treat relative clauses as a distinct structure, outside the realm of ergativity. This suggests that the L2 participants are learning

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[5] A few notes should be made as to the L2 curriculum. The first is that although the ergative case marker is introduced early in the L2 curriculum, the emphasis tends to be on word order (VSO), which may account for the lack of ergative case in the pretest. The second is that the transitive suffix *–ina*, on the other hand, is introduced much later in the curriculum, and only included in more advanced, often, formulaic expressions. This may explain the lack of *–ina* in the pretests. And finally, the L2 curriculum centers around the *t*-style.

ergative features as construction-specific elements, only applying them to structures to which they had been exposed to in close proximity with the intervention. Heritage participants, on the other hand, generalized the recovered ergative features applying them accross a range of structures, including those for which they had received no intervention (i.e. relative clauses) and had no previous exposure (i.e. resumptive pronouns). L2 speakers, then, do not show any signs of a change in their underlying grammar, but rather only the addition of newly acquired surface features.

These results clearly show that L2 participants underperformed heritage participants not only in the recoverability of ergative features, but also in the retention and extension of ergativity cross-structurally. The implications of these results as they apply to the Permanence and Contingency Hypotheses are discussed in the following section.

6.4 Conclusion

This chapter set out to answer the question as to whether the robust heritage recovery of ergativity could be attributed to latent knowledge from acquisition in childhood that had been reactivated by the targeted intervention. The results from the investigation into L2 Samoan speakers demonstrates that this indeed may be the case. The fact that heritage speakers recovered a pattern of ergativity, while L2 speakers acquired individual ergative features that were construction-specific, suggests that heritage speakers were in some way primed for ergativity. Although these particular ergative phenomena may not have been fully acquired in childhood, or perhaps, acquired and later attrited, the underlying groundwork for ergativity seems to have persisted into adulthood. The intervention served to offer specific ergative reflexes (i.e. case, *-ina*) and demonstrate their pattern of use, which in turn reactived long-dormant pathways critically connecting grammatical features along ergative lines.

These observations are consistent with the Permanence Hypothesis, that is, although change in exposure can lead to a redirecting of cognitive resources, the linguistic knowledge that was already acquired during critical learning periods is never lost, in this case, ergativity. In the face of language shift, knowledge of ergativity became less accessible, but it nevertheless persisted. This means that although heritage speakers appear to be lacking in key grammatical features, this knowledge need not be reacquired, but rather, merely reactivated. Heritage speakers, then, do indeed benefit from their childhood learning. This has far reaching

implications not only for language development, but also language pedagogy especially in the pursuit of language maintenence. These issues and more are explored further in the following chapter.

Chapter 7. Conclusion

This concluding chapter provides an overview of the key results presented in the previous chapters, discussing in detail the implications of these findings for the field of language development. Future directions of research, as well as remaining theoretical issues, are explored in regards to both morphological and syntactic ergativity. Finally, possible applications of this research for language maintenance efforts are offered (i.e. language pedagogy).

7.1. Summary of Key Findings.

Table 7.1 summarizes the major findings of the study by indicating whether an improvement was observed for each of the relevant ergative features across the three intervention types (i.e. control, morphological, syntactic) from the two speaker groups (i.e. heritage, L2).

Table 7.1. Observed Improvement from Ergative Intervention

	HERITAGE			**L2**		
Ergative Feature	Control	Morph	Synt	Control	Morph	Synt
Erg. Case in Declaratives	no	**yes**	**yes**	no	***yes**	***yes**
Erg. Case in O-WhQs	no	**yes**	**yes**	no	***yes**	***yes**
-*Ina* Suffix in A-WhQs	no	no	**yes**	no	no	***yes**
Erg. Case in O-RCs	no	**yes**	**yes**	no	no	no
-*Ina* Suffix in A-RCs	no	no	**yes**	no	no	no
Resumptive Pronouns in RCs	no	no	**yes**	N/A	N/A	N/A

* less of an increase than heritage group, and greater drop-off in delayed post-test

The results presented in Table 7.1 culminate into four key findings, each of which is discussed in detail below.

1. Ergativity is a fragile feature of Samoan.

The pretests for both heritage and L2 speakers revealed a conspicuous lack of ergative features, both morphological and syntactic, which starkly contrasted with the results from native speakers. This finding demonstrates that although Samoan exhibits a robust system of ergativity, ergative features are acutely susceptible to changes in language input. In fact, there was no

substantial difference in the pretests distinguishing heritage speakers from their L2 counterparts, leaving no indication of any grammatical remnants from early exposure to the language during childhood. This is consistent with the findings from child language acquisition, showing that ergativity is an unusually late acquisition (Ochs 1982, Muāgututi'a et al. 2016), and as a result, perhaps more prone to incomplete acquisition and attrition. Samoan ergativity, then, is indeed a fragile feature of language (i.e. late to acquire, quick to attrite).

2. Ergative features are recoverable through intervention.

Both the heritage and L2 intervention expierments clearly showed that, in spite of the fragility of Samoan ergativity, ergative features are indeed recoverable. This was demonstrated by first showing that the control groups did not show any increase in ergativity across the pretests, immediate post-tests, and delayed post-tests, thus ruling out the possibility that any increase in ergativity could be attributed to the testing paradigm. Second, it was demonstrated that only those groups that received an intervention (i.e. morphological and syntactic groups) showed a subsequent improvement in the use of ergative features. The degree of improvement depended upon two decisive factors: i) the type of intervention the participant received (i.e. morphological or syntactic), and ii) the participant's language profile (i.e. heritage or L2 speaker). These factors make up the last two key findings presented below.

3. Exposure to syntactic ergatvitiy yielded greater results than morphological ergativity alone.

For both the heritage and L2 experiements, the syntactic groups showed greater increase in ergative features. These groups were given the *Wh*-Question Intervention Task which trained them in both ergative case in O-WhQs (i.e. morphological ergativity) and, crucially, the transitive suffix *–ina* in A-WhQs (i.e. syntactic ergativity). The morphological groups, however, received the Declarative Intervention Task, which trained them only in ergative case in transitive declaratives (i.e. morphological ergativity).

While the morphological groups were able to recover morphological ergative case in declaratives, *wh*-questions, and relative clauses (heritage only), syntactic ergative features eluded them, namely the transitive suffix *–ina* and resumptive pronouns (heritage only). The syntactic groups, on the other hand, recovered both morphological and syntactic features in declaratives, *wh*-questions, relative clauses, and resumptive pronouns (the latter two occured in the heritage

group only. This finding suggests that exposure to morphological ergativity is inferior to syntactic ergativity. Syntactic ergativity here comprises both morphological ergative features as well as syntactic ergative features, making it a richer form of intervention. This specific type of intervention, coupled with the particular language profile of a heritage speaker, resulted in a considerably robust recovery of ergativity.

4. Heritage speakers outperformed L2 counterparts.

Finally, the most intriguing finding is the substantial difference in recovery between the two speaker groups. That is, heritage speakers substantially outperformed the L2 group in three crucial areas. The first was the rate of increase. The immediate post-tests demonstrated that heritage speakers showed a greater increase of ergative features in each construction included in the intervention. While the L2 groups also showed some improvement in ergative case (72% in Declaratives) and *-ina* (54% in WhQs) in both declaratives and *wh*-questions following the intervention, they did not reach the same level of increase as the heritage groups (84% ergative case in Declaratives, 88% *-ina* in WhQs).

The second area of difference was durability. The delayed post-tests demonstrated a stark decrease in ergative features from the immediate post-tests for the L2 groups (24% ergative case in Declaratives, 18% *-ina* in WhQs), while the heritage groups maintained the increase they had achieved in the immediate post-test to a greater degree (71% ergative case in Declaratives, 74% *-ina* in WhQs). This suggests that the heritage group experienced a more durable recovery of ergative features than the L2 group.

The third and final distinguishing area of difference between the two groups was the extent of recovery. The L2 group appeared to have recovered construction-specific features. As the more conservative learners, L2 speakers did not extend any of the ergative features from declaratives and *wh*-questions (included in the intervention) to relative clauses. The heritage group, on the other hand, were more liberal learners in that they extended ergative features to constructions not included in the intervention without overgeneralizing (i.e. applying ergative case and *–ina* in inappropriate contexts), demonstrating the recovery of an underlying pattern of ergativity. The heritage morphological group, who were trained only in ergative case in declaratives, extended the use of ergative case to *wh*-questions and relative clauses. More impressive was the heritage syntactic group who not only extended the ergative case and

transitive suffix *–ina* to constructions not included in the intervention (i.e. declarative and *wh*-questions), but they also showed improvement in an ergative feature for which they did not receive any training: resumptive pronouns. This suggests that heritage speakers were able to take individual pieces of evidence to realign their underlying grammar along ergative lines. L2 speakers, on the other hand, were able to learn individual ergative features, but fell short of acquiring the underlying system. It is clear here that heritage speakers were able to achieve a much more robust recovery of ergativity than their L2 counterparts.

These key findings offer intriguing implications for language development, as well as ergativity, both of which are explored in the following section.

7.2. Implications of Findings.

Two important implications of these findings are discussed here. The first addresses the difference in effect of intervention involving syntactic ergativity versus morphological ergativity, and the second speaks to the robust recovery of ergativity by heritage speakers in contrast to the L2 speakers.

The difference in results between the morphological and syntactic group makes it clear that the morphological group did not achieve any level of syntactic ergativity. This is to be expected, given the typological universal discussed in the previous chapters, that is, syntactic ergativity entails morphological ergativity, but morphological ergativity does not entail syntactic ergativity (Dixon 1979). It follows then that even though participants are trained in morphological ergative features, there would be no inclination for them to deduce syntactic ergativity, and therefore extend ergative features to certain syntactic processes. However, this entailment relationship could imply the reverse. That is, given only syntactically ergative cues, a participant would be given good reason to possibly infer morphological ergativity, and thus extend ergative features from syntactic procceses to include certain morphological elements. The results from the current study show that those who were trained in syntactic ergativity experienced a more robust recovery for not only syntactic ergativity, but also morphological as well. However, it should be noted that those in the syntactic group received intervention in both syntactic (i.e. *–ina*) and morphological (i.e. case) features (albeit only in *wh*-questions), while those in the morphological group received intervention only in morphological features.

In sum, then, it is clear that exposure to syntactic ergativity made a difference; however, it is unclear if this difference was due to the entailment relationship between syntactic and morphological ergativity, or perhaps instead to exposure to a greater number of ergative cues. This study was unable to tease apart the syntactic and morphological motivations to address the entailment relationship; however, possible avenues for future research in this area are offered in the following section.

The second important implication from these findings is the source of the heritage recovery of ergativity. One of the key research objectives of this study was to address the Permanence Hypothesis (Brenner 2010), that is, the persistence of grammatical knowledge acquired during critical language periods. These findings lend suport to this hypothesis, in that heritage speakers were seen to have recovered a robust system of ergativity given only two ergative cues (i.e. one morphological, one syntactic) in only one construction (i.e. *wh*-questions), a feat that eluded their L2 counterparts. This points to a key difference between these two speaker groups as the crucial factor: early exposure. This means that early exposure to key linguistic elements during critical learning periods, even with fragile features like ergativity, endure through adulthood in spite of language shift. Although these features may become dormant, or latent, due to changes in language input, they are recoverable through careful linguistic intervention. Exposure to these key features in adulthood, after the critical period, do not endure in the same way. This key finding of this study opens up many directions of future research, some of which are discussed in the following section.

7.2.1 Future Directions.

The implications from this study offer some very intriguing avenues for further research. Five of these avenues are presented here.

The first is the investigation into the comprehension of ergativity in heritage speakers. This study focussed primarily on the production of ergative features, which were initially shown to be lacking in the heritage grammar. However, given the subsequent recovery of these features, suggesting the enduring, yet latent, presence of this grammatical knowledge, might these obstensibly dormant features be detected in a more passive capacity, that is, comprehension? Would an elicited comprehension task reveal ergative elements in heritage grammar that alluded the production tasks? Or is the comprehension of ergative features for

heritage speakers just as ellusive as their production? This is an important piece of the puzzle that was unfortunately oustide the scope of the current study, but is a definite next step in attaining a deeper understanding of ergativity as it pertains to heritage grammar.

The second area to pursue in further research is the form of the intervention itself. This study included both instruction (i.e. explicit modeling) and recasts (with prosodic emphasis and imitations) in the intervention tasks. From this, the question arises as to whether the same results could be achieved with less intervention. Could heritage speakers recover key ergative features using only recasts in the intervention (with no instruction)? Or perhaps only using recasts without prosidic emphasis or imitation? What might be the minimal intervention needed to trigger a recovery of ergativity? And would this reveal even greater differences between heritage and L2 speakers (e.g. heritage speakers require less for recovery)? These are indeed more intriguing questions to investigate further.

The third area for future research involves the relationship between morphological and syntactic ergativity. This study observed the extension of ergative case (i.e. morphological) as well as *–ina* (i.e. syntactic) across various constructions. Only those, however, that received training in syntactic (and morphological) elements extended ergativity to novel features (i.e. resumptive pronouns). This leads to the question of whether comprehensive extension is a characteristic of syntactic ergativity only, that is, only syntactic cues (not morphological) signal the possibility of an underlying pattern of ergativity, and thererfore, greater extension. For this question to be addressed, an additional experiment woud be needed to see if heritage speakers would extend to novel morphological features given only morphological cues. For example, would participants who were trained only ergative case marking then extend this morphologically ergative pattern to produce ergative agreement? If so, this would indicate that extension is not limited by ergativity type. If not, however, this would suggest that syntactic ergativity offers a more powerful indicator of an underlying ergative pattern.

Another question that arises from the issue of ergativity type, is whether syntactic ergativity might be extended to more distantly related constructions. This study presented extension from *wh*-questions to relative clauses and resumptive pronouns. Each of these constructions are closely related not only in terms of surface form (i.e. *–ina*), but also in terms of structure (i.e. filler-gap depencies). However, could syntactic ergativity be extended beyond these related structures? For example, if participants were trained on the ergative pattern of the

transitive suffix *–ina* in *wh*-questions, would this then prompt them to extend this pattern to quantifier float, where the quantifier takes scope over only S and O arguments with the exclusion of A? What are the limits of syntactically ergative cues?

And the final question to be addressed regarding morphological and syntactic ergativity, is whether the full spectrum of ergativity (i.e. both morphological and syntactic) can be recovered given only syntactic cues. The current study was unable to address this question due to the fact that in Samoan, syntactic cues could not be isolated from morphological cues in order to present a purely syntactic intervention. This question would perhaps require looking outside of Samoan to a language where the two types of cues can be presented separately. In a language of this type, would intervention in relativization only (i.e. syntactic) trigger ergativity in *wh*-questions (i.e. syntactic) as well as the case system or agreement (i.e. morphological)? This would be a fascintaing result, interconnecting linguistic typology with language acquisition and heritage linguistics. A result, however, that is outside the scope of the current study.

The fourth direction for future research is to explore further the fragility of ergativity. In this study, ergativity in Samoan was seen to be fragile due to the fact that it is late acquired in L1 acquisition and lacking in heritage and L2 grammar. However, what is it exactly about ergativity that makes it fragile? Is it due its typological markedness as a morphosyntactic system? Or perhaps the degree to which ergativity is entrenched in the grammar? And is fragility a universal feature of ergativity cross-linguistically, or perhaps unique to a small set of languages (i.e. Samoan, Hindi, Dyirbal)? Addressing this question would certainly broaden our understanding of ergativity as a whole, and perhaps provide further insight into the recovery of Samoan ergative features.

And finally, the fifth direction of further research is that of permanence. Two crucial issues are addressed here. The first is determining what aspects of ergativity, if any, persisted allowing the robust heritage recovery. It was clear in this study that heritage speakers did not exhibit particular ergative features in key constructions; however, a more exhaustive investigation is needed to determine whether heritage speakers may be exhibiting ergativity in structures that were not tested in this study (i.e. word order, quantifier scope, agreement), which may have aided in their recovery of other ergative features. If no sign of ergativity can be found, the second issue would be to determine if perhaps other fundamental factors have persisted, other than ergativity (i.e. phonology, lexicon), that allow heritage speakers to better recover ergative

features. That is, the heritage speakers in this study may have had a better grasp on phonology and vocabulary that allowed them to focus solely on learning ergative features during the intervention. L2 speakers, on the other hand, may have had to devote more cognitive resources in processing the phonology and vocabulary in each of the tasks, significantly decreasing their capacity to focus on, and thus acquire, ergativity. Addressing this question would require an investigation of both phonology and vocabulary for both heritage and L2 speakers, which was unfortunately beyond the scope of the current study.

Nevertheless, each of these issues hold intriguing opportunities for further research in the field of language development. While the answers to those questions await future inquiry, the findings from the present study offer valuable insight for the current maintenance of the Samoan language.

7.3. Application for Language Maintenance.

As stated in introduction of this dissertation, recent trends have shown a consistent shift away from the use of the Samoan language in both diasporic communities (Lesā 2009, Wilson 2010, Alofaituli 2011), and American Sāmoa (Freese & Haleck 2000, Hunkin-Finau 2010). This has given rise to the need for language maintenance programs, the majority of which, have developed in the diaspora (i.e. New Zealand, Australia, Hawai‘i, California, Utah, etc.).

While the need and interest for this work has received considerable attention, there has been inadequate linguistic research to inform the development of curriculum and materials for these language programs. The ultimate goal of the research from this disseration is to provide some insight to help better facilitate the maintenance (i.e. teaching and learning) of the Samoan language. This concluding section discusses three possible applications based on the findings from the current study.

The first is the importance of early exposure to the language. This study demonstrated the enduring effects of the most fragile of linguistic features (i.e. ergativity) due to exposure during critical learning periods in childhood. This finding has two applications. The first is the importance of Samoan language programs for children, exposing them to the language as early as possible. This is not a new idea, as many Samoan language maintenance programs focus on early childhood education (e.g. *Ā‘oga ‘Āmata*), modeled after the Māori *Kōhanga Reo* ‘Language Nest’. The second application however is more novel, in that, language programs

targetting heritage speakers can be especially effective. The current study showed that heritage speakers have the potential to recover entire systems of grammar given the right cues. Heritage language programs then can be exceptionally pivotal in reviving the use of Samoan, and in turn, the natural process of intergernerational transimission in diasporic communities, as well as for those in American Sāmoa and Sāmoa that might be experiencing considerable language shift.

The exceptional trajectory of heritage language learning demonstrated in this study offers the second general application for language maintenance programs. That is the distinction in linguistic development between heritage and L2 learners. This might call for separate tracks for the different learner types (i.e. heritage and L2) to better tailor the curriculum to their specific needs. Grouping them together A program that caters to heritage learners may move to fast leaving L2 learners behind, while a program catered to L2 learners may be too slow for heritage learners ultimately leaving them disinterested and disengaged. Each would benefit more from a program that fits their specific learning needs. This is not unheard of across language teaching programs. Some universities do have language courses specifically for heritage learners; however, this has not yet been applied to Samoan language courses.

The third, and final, application addresses Samoan language curriculum itself. This study clearly showed that ergativity is a fragile feature lacking in the grammar of both heritage and L2 speakers, revealing a crucial gap in grammatical knowledge. Language pedagogy, then, would benefit greatly from directly addressing this gap in the curriculum. Ergativity should be the grammatical focus, given the fact it poses exceptional difficulty for learners dominant in English. And in fact, findings from the current study suggest that an integrated approach, teaching both morphological and syntactic ergativity simultaneously, would be the most beneficial. The current tendency in Samoan language curricula is to introduce the ergative case in declaratives in isolation, often reserving relativation and *wh*-questions only for the very advanced, if at all. However, it may be more effective to introduce these together, earlier in the course.

7.4. Concluding Remarks.

Heritage linguistics has much to offer linguistic theory, as well as the field of language acquisition. The result of this type of research can provide invaluable insight into our understanding of the diversity of language development, opening doors for practical applications for language maintenance. The hope is that the research presented in this disseration offers this

type of insight for the maintenance of the Samoan language, and in addition, sparks further interest and inquiry encouraging the undertaking of much needed research to continue to inform language maintenance efforts to ensure the longevity of our language, and with it, the voice of our ancestors.

Appendix A. Language Background Survey.

1. DEMOGRAPHICS

1. Name _____
2. Gender _____
3. Date of birth _____
4. Birthplace _____
    a. If you were born in Samoa or Am. Samoa, at what age did you move off island? _____
5. Current place of residence _____
6. Do your parents speak Samoan? YES NO
    a. If yes, did your parents / grandparent speak Samoan to you as a child? YES NO
7. Did you speak or understand Samoan as a child? YES NO
8. At what age was your first exposure to the Samoan language? _____
9. Do you attend a Samoan church? YES NO
10. Have you ever lived in Samoa or Am. Samoa? YES NO
    a. If so, for how long? _____ b. and at what age? _____

2. LANGUAGE PROFICIENCY, DOMINANCE

11. How well do you speak English?

1	2	3	4	5
Very few words				Fluent

12. How well do you speak Samoan?

1	2	3	4	5
Very few words				Fluent

Appendix B. Cloze Test.

(based on Brown 1994)

Text

Sā ʻou ala i luga i le ono i le vaveao ananafi ʻae ʻua ʻou toe fia moe. Sā _____[1] loʻu moega ma loʻu ʻieʻafu. Sā _____[2] i totonu i laʻu pusa toso _____[3] iai soʻu ʻofu tino ma se _____[4] mānaia ona ʻou auli lea 'o _____[5] ʻofu ā'oga ma ʻāmata ona sāuni _____[6] le āʻoga. Sā ʻou alu e _____[7] ma fufulu oʻu nifo ma oʻu _____[8]. Sā sele laʻu ʻava ma selu _____[9] loʻu ulu. Sā fai loʻu ʻofu _____[10] ma tuʻu laʻu tusi āʻoga i _____[11] o laʻu ʻato.

Results

HERITAGE

	Participant	%	Participant	%	Participant	%
1	C.H.KMF	0.82	M.H.LMM	0.91	S.H.ELM	0.91
2	C.H.TLM	0.82	M.H.FLF	1.00	S.H.ALF	0.82
3	C.H.MFF	0.91	M.H.TMM	0.82	S.H.LFM	0.91
4	C.H.MLF	1.00	M.H.VMF	1.00	S.H.GFM	0.82
5	C.H.JFF	0.91	M.H.AUF	0.82	S.H.SUM	0.82
6	C.H.FMM	1.00	M.H.SSM	0.91	S.H.JMF	0.91
7	C.H.LVF	0.82	M.H.SUF	1.00	S.H.SWF	0.91
8	C.H.JLM	0.91	M.H.AEF	0.91	S.H.BSF	1.00
9	C.H.SIM	0.82	M.H.JMF	1.00	S.H.VWM	0.91
10	C.H.SMM	0.82	M.H.PSM	0.73	S.H.LFF	0.82
11	C.H.SPF	0.82	M.H.ACF	0.91	S.H.KFF	1.00
12	C.H.PFM	0.91	M.H.MSM	1.00	S.H.JNM	0.82
13	C.H.TPF	0.82	M.H.NIF	0.91	S.H.FMF	0.82
14	C.H.SPF	0.91	M.H.DMF	1.00	S.H.DMM	0.91
15	C.H.ATF	0.82	M.H.MMM	0.73	S.H.TTM	0.91
	Total	**0.87**	**Total**	**0.91**	**Total**	**0.88**
	Range	**.82-1**	**Range**	**.73-1**	**Range**	**.82-1**
			TOTAL	**0.89**		
			RANGE	**.73-1**		

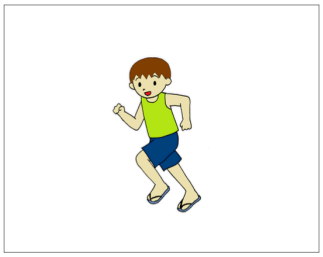
L2

	Participant	%	Participant	%	Participant	%
1	C.SL.MEM	0.82	M.SL.KPM	0.55	S.SL.BSM	0.55
2	C.SL.CHF	0.64	M.SL.JRM	0.82	S.SL.CSM	0.82
3	C.SL.BSF	0.91	M.SL.RFM	0.62	S.SL.HFF	0.91
4	C.SL.KMF	0.55	M.SL.JGF	0.91	S.SL.GNM	1.00
5	C.SL..JLM	0.91	M.SL.JHM	0.55	S.SL.TSF	0.91
6	C.SL.RTM	0.73	M.SL.KRM	0.91	S.SL.SHM	0.91
7	C.SL.DVM	0.82	M.SL.LJF	0.73	S.SL.GHM	0.73
8	C.SL.DTF	0.55	M.SL.MRM	0.82	S.SL.DUM	0.64
9	C.SL.BSM	0.82	M.SL.BHM	0.55	S.SL.DGM	0.55
10	C.SL.DNM	0.91	M.SL.JMM	0.82	S.SL.MTM	0.82
	Total	**0.76**	**Total**	**0.73**	**Total**	**0.78**
	Range	**.55-.91**	**Range**	**.55-.91**	**Range**	**.55-1**
			TOTAL	**0.76**		
			RANGE	**.55-1**		

Appendix C. Declarative Sentence Completion Task Items.

Intransitive Declarative Items

1



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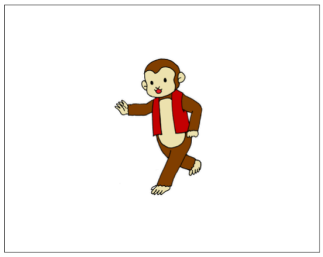

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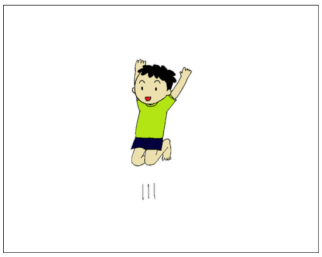

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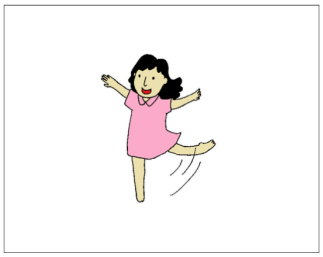

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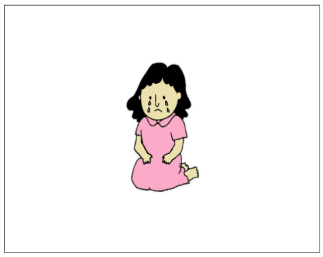

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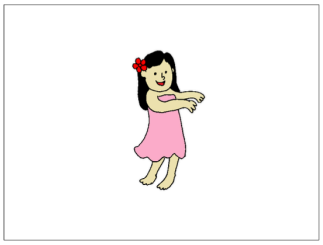

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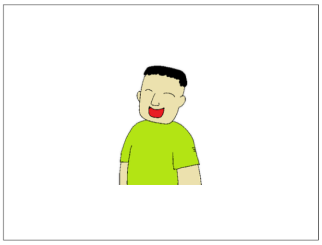

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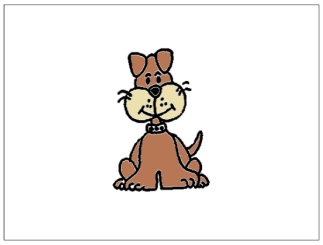

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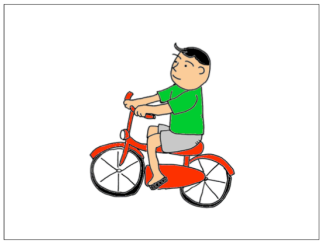

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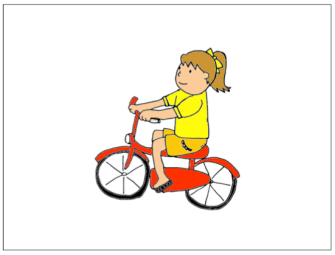

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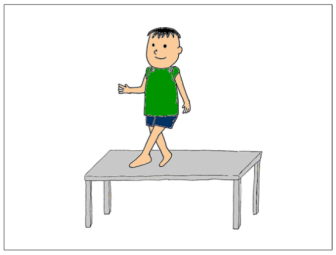

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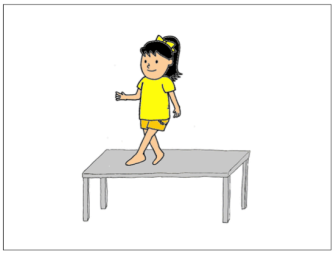

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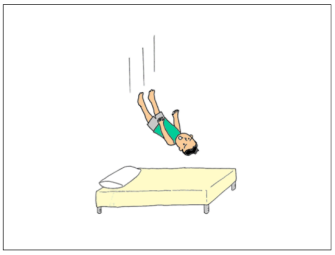

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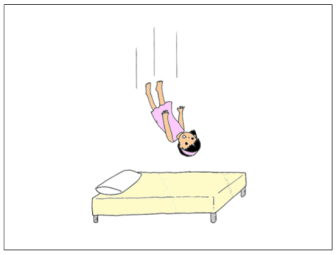

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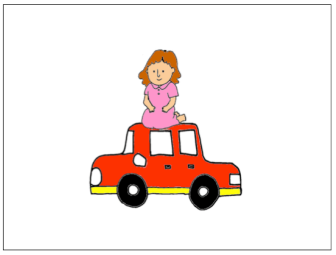
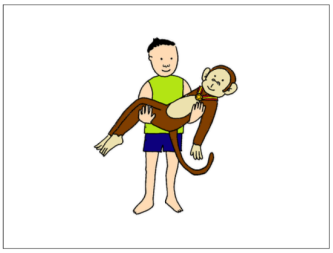


18

Transitive Declarative Items



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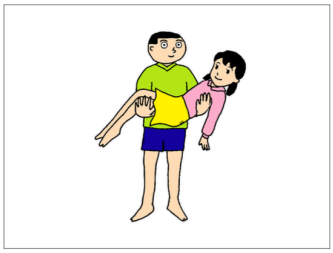

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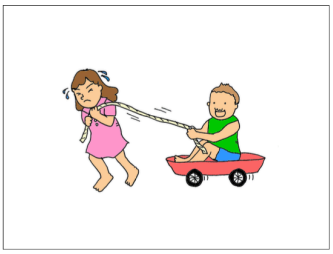

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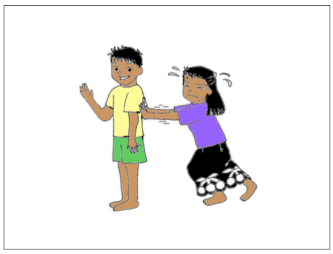

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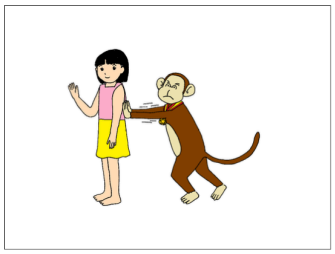

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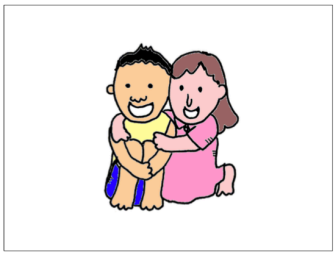

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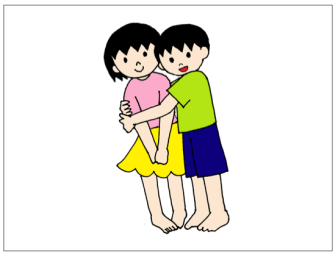

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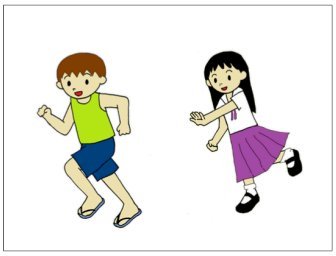

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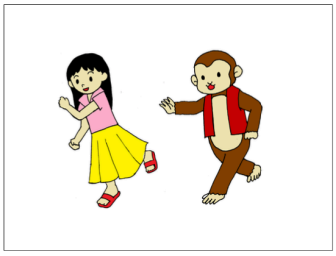

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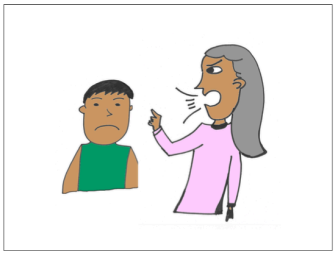

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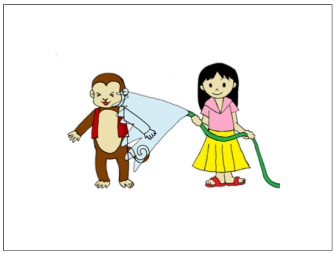

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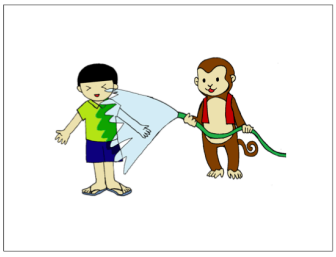

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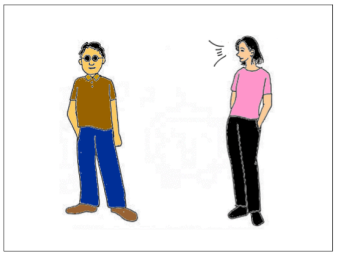

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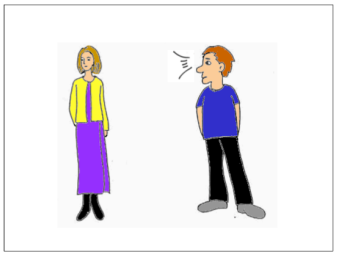

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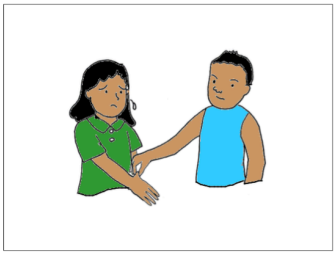

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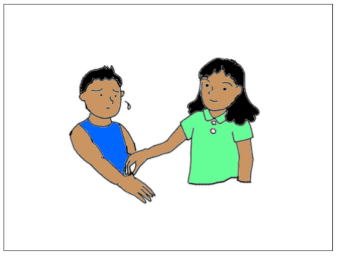

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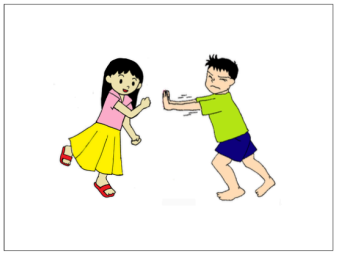

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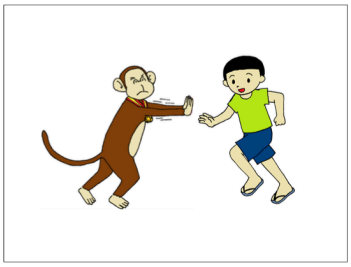

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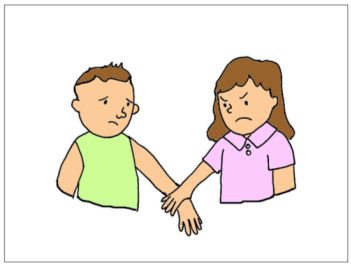

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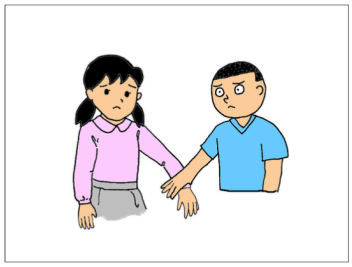

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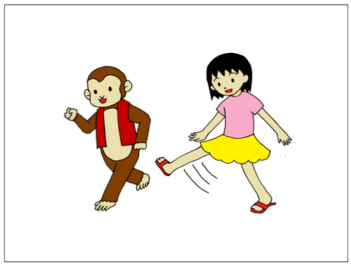

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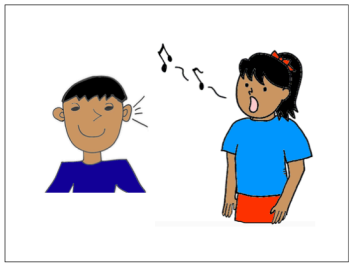

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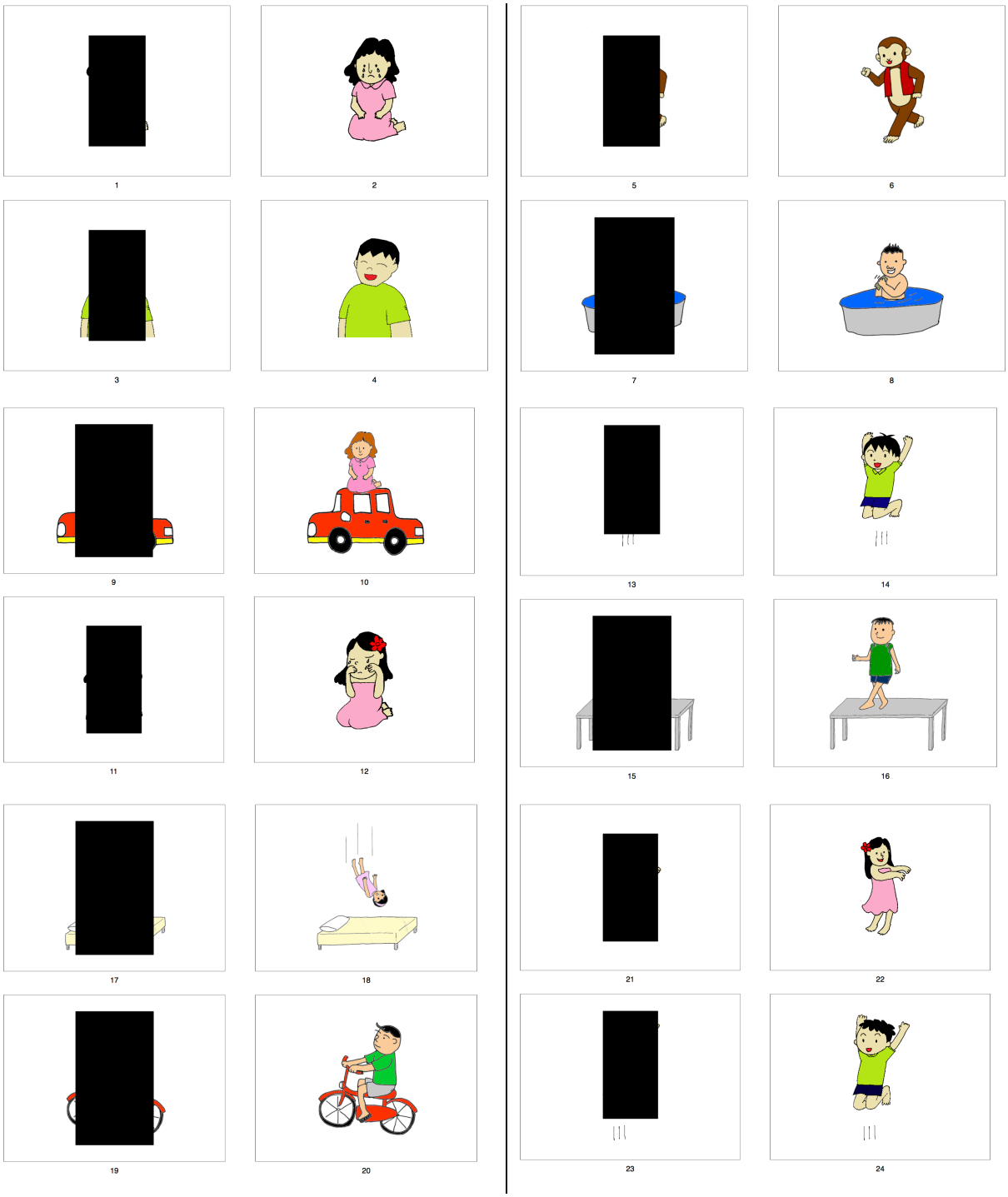
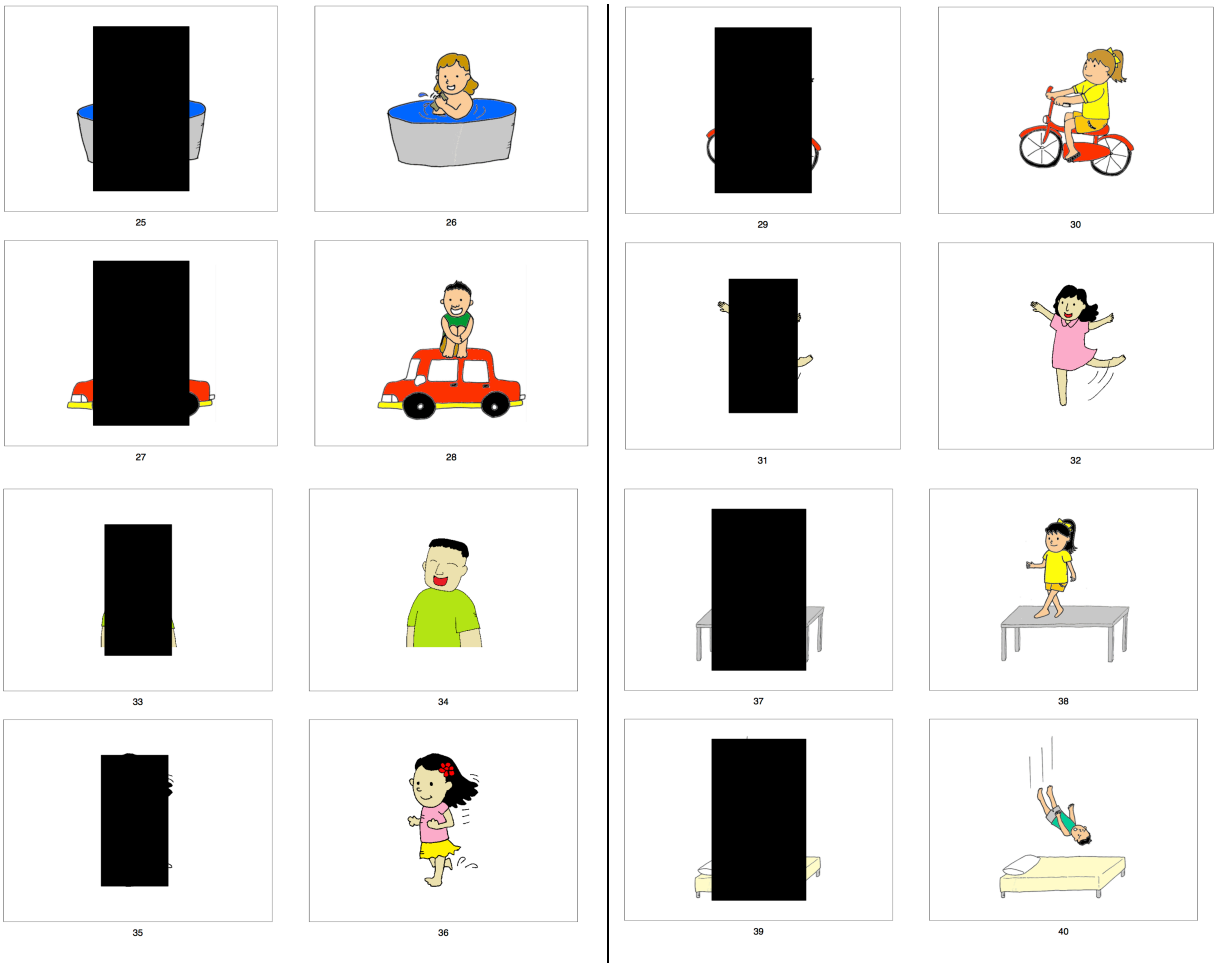
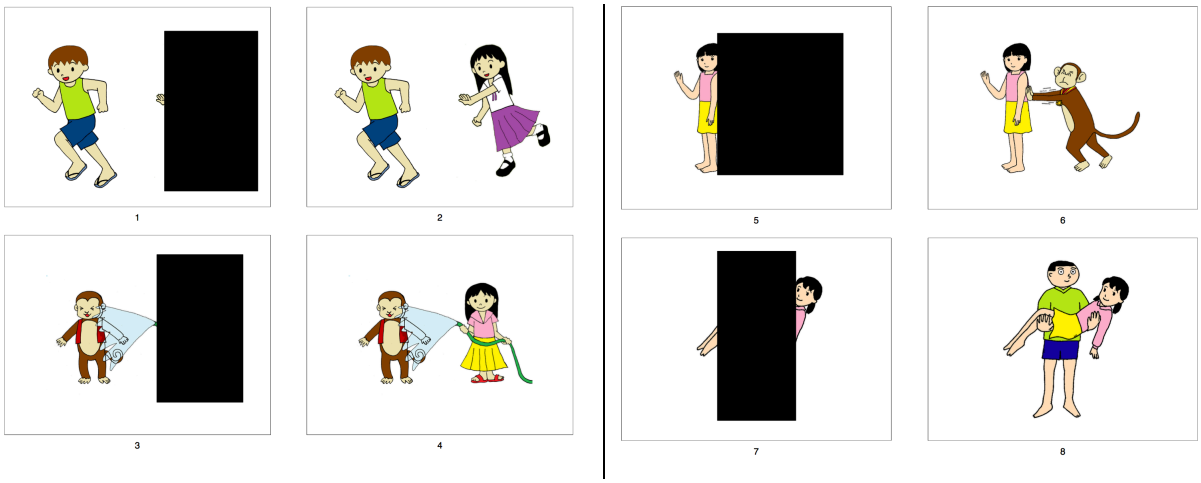
Appendix D. *Wh*-Question Production Task Items.

S-WhQ Items





A-WhQ Items

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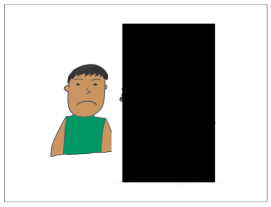
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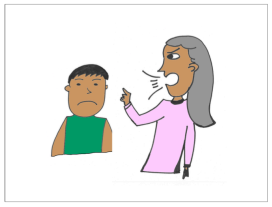
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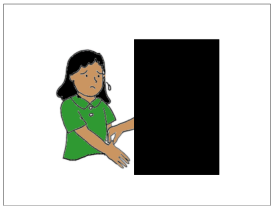
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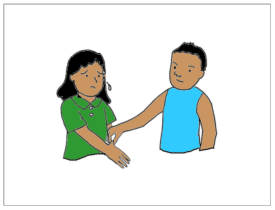
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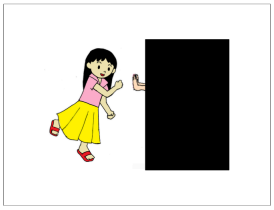
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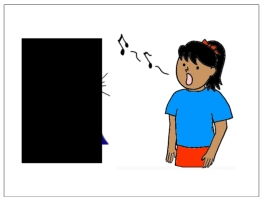
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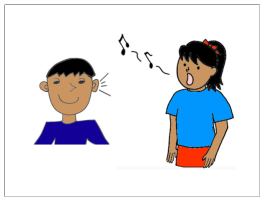
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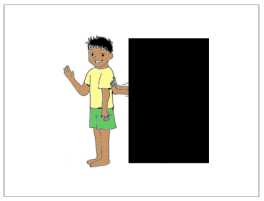
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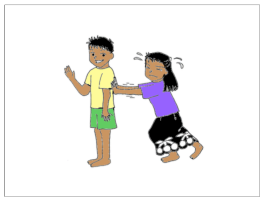
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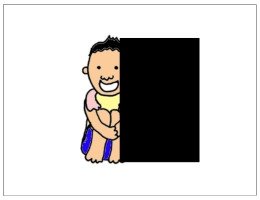
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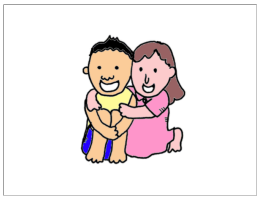
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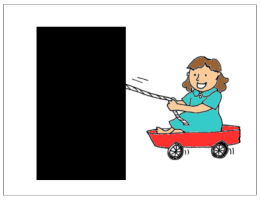
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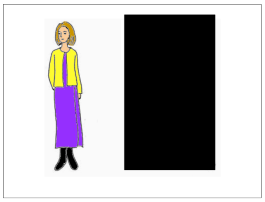
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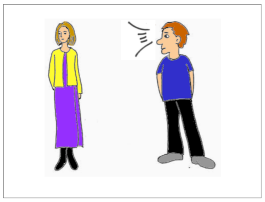
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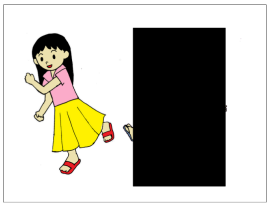
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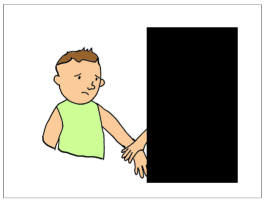
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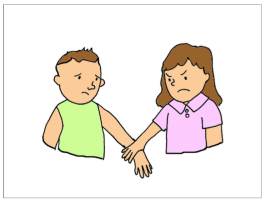
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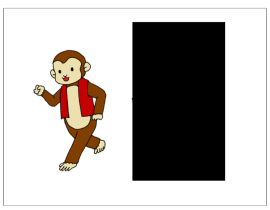
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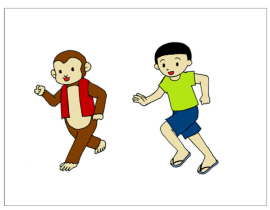
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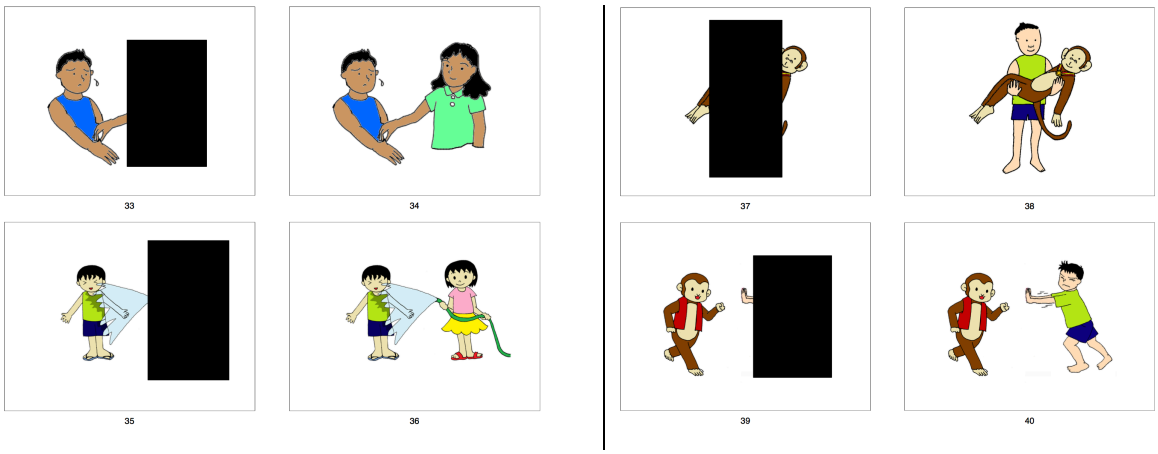
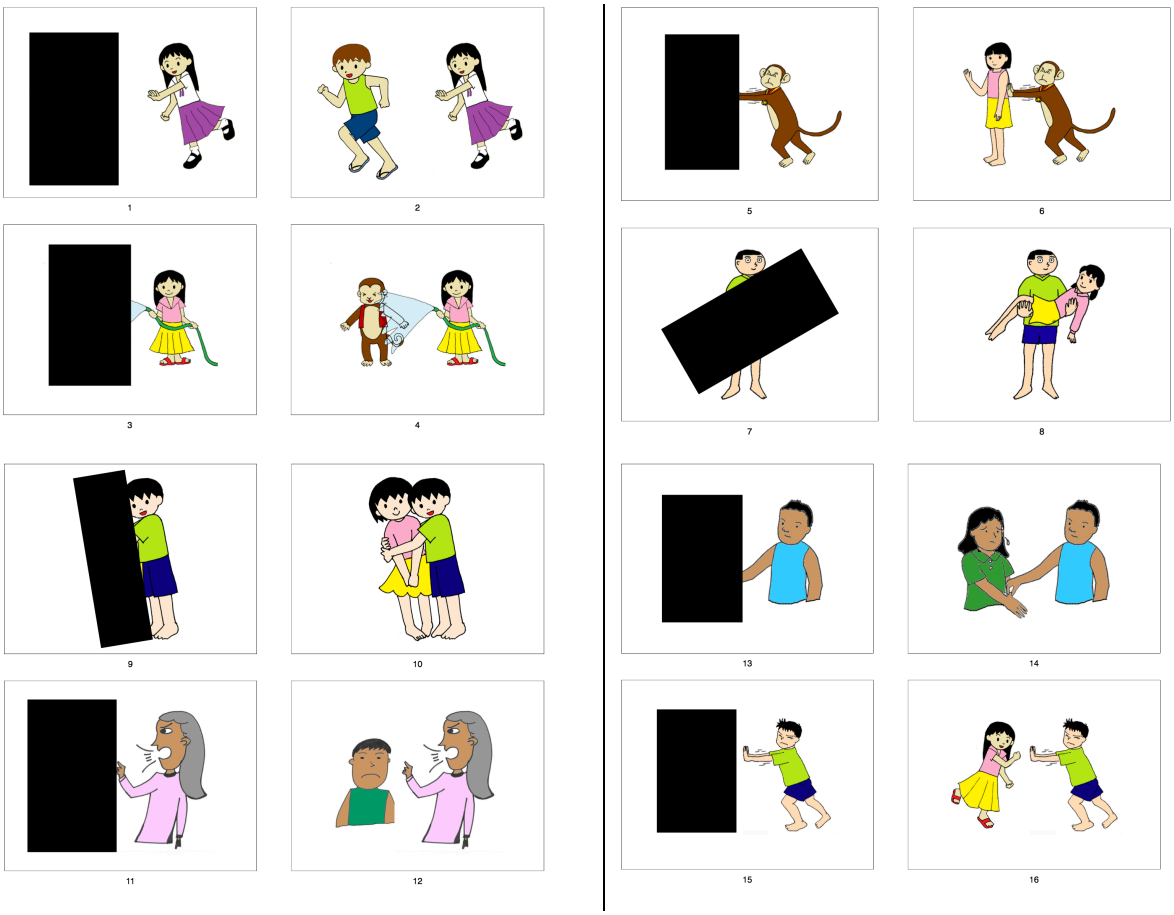
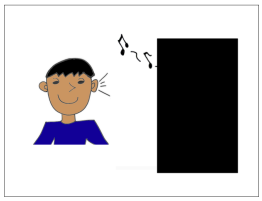


O-WhQ Items





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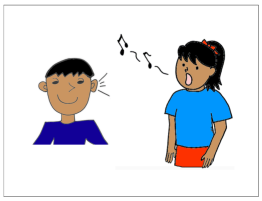

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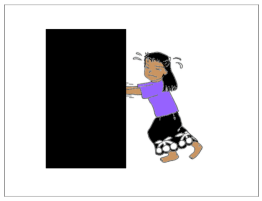

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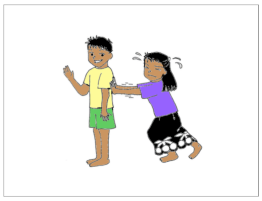

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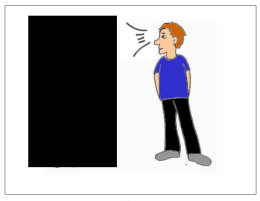

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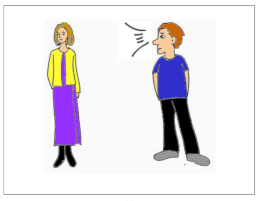

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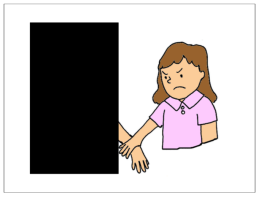

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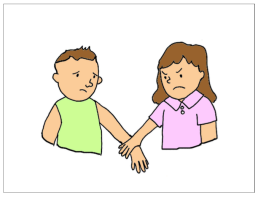

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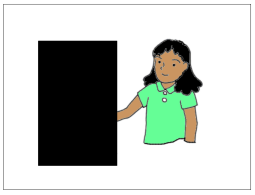

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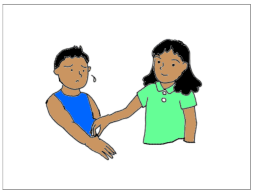

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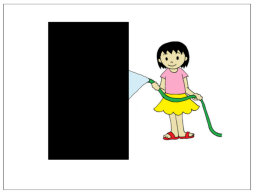

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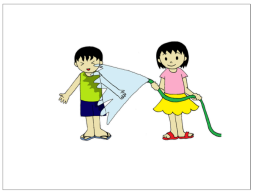

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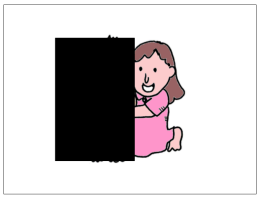

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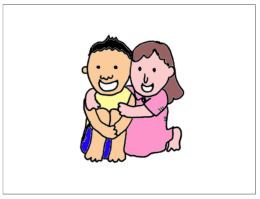

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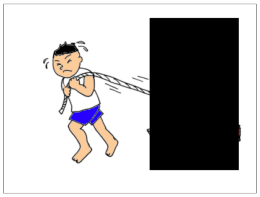

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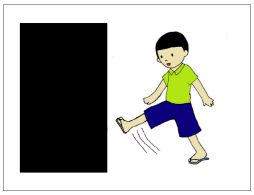

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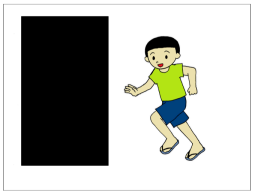

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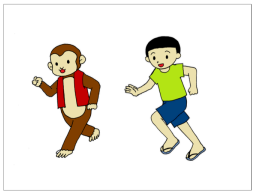

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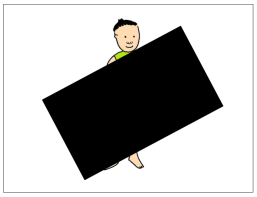

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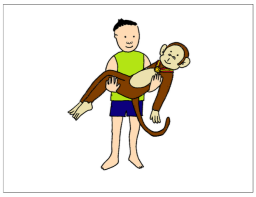
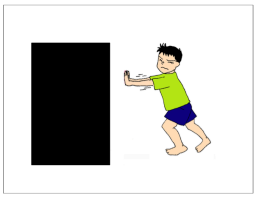
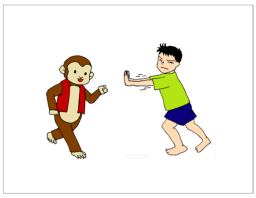


38



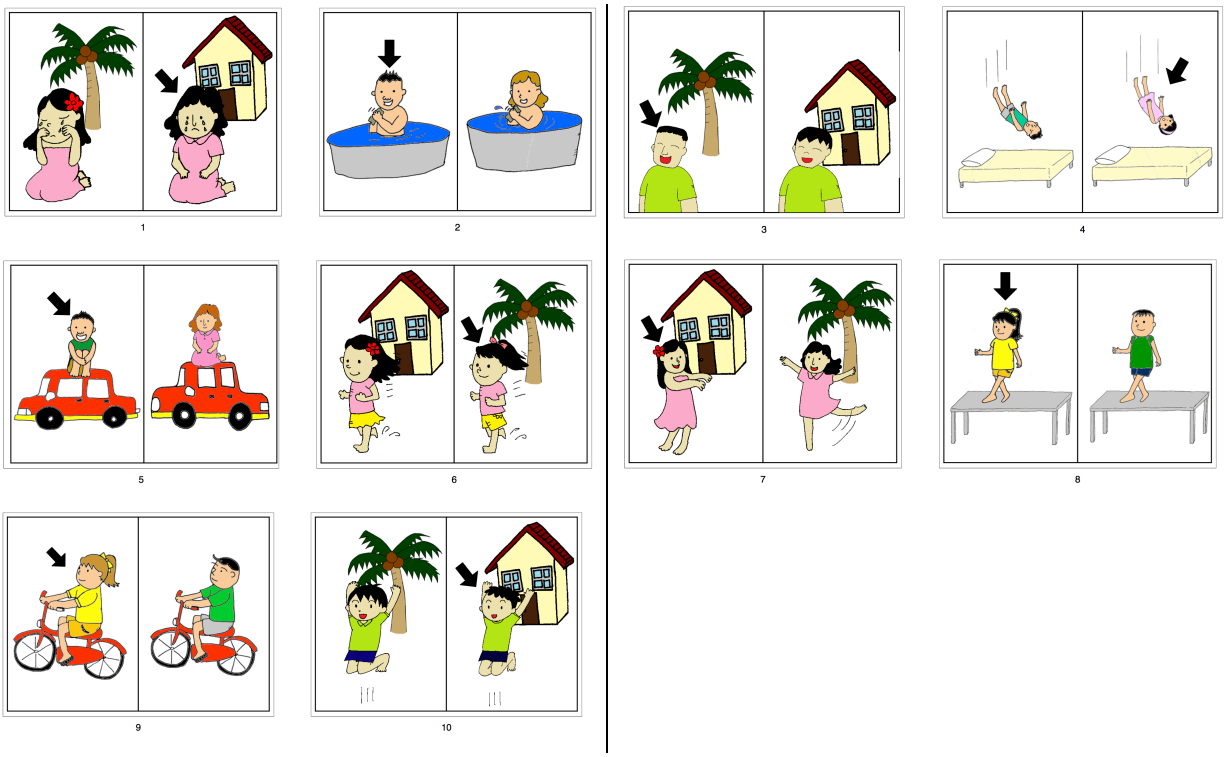
39



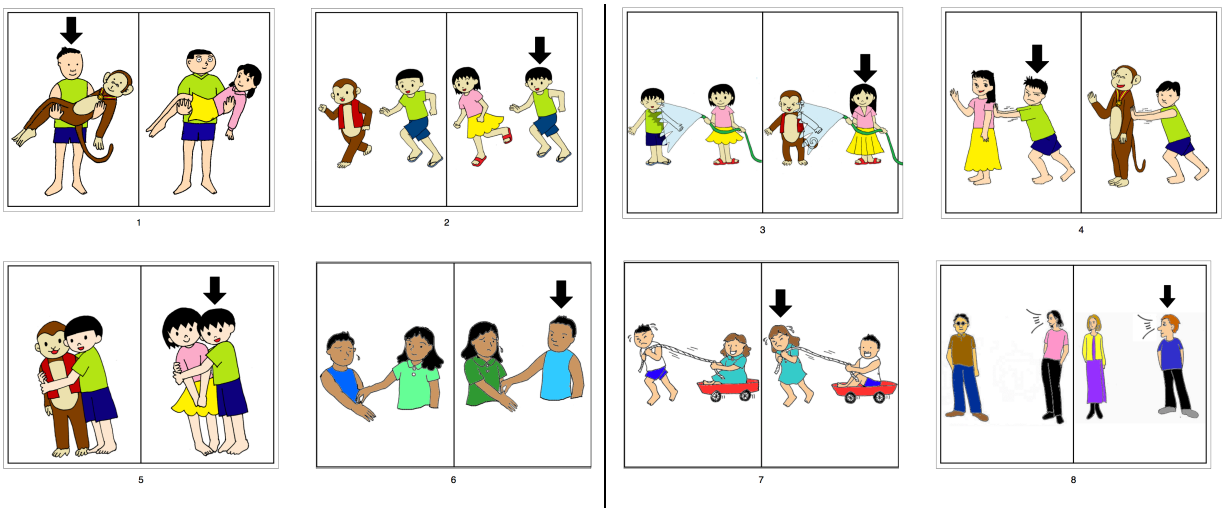
40

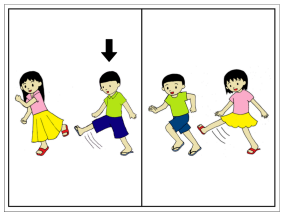
Appendix E. Relative Clause Production Task Items.

S-RC Items



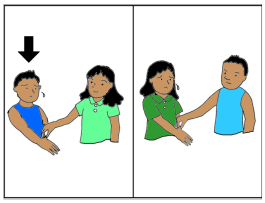
A-RC Items



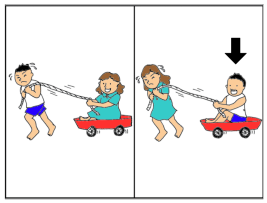


9

O-RC Items



1



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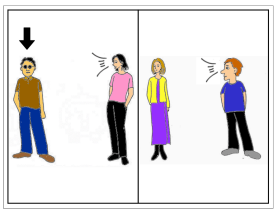

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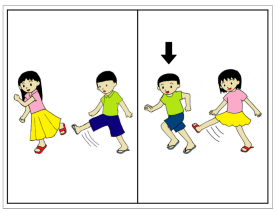
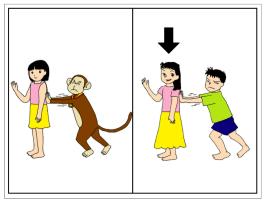
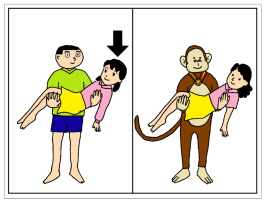


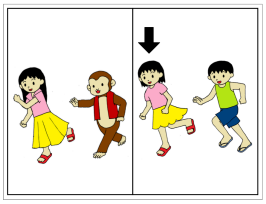
4



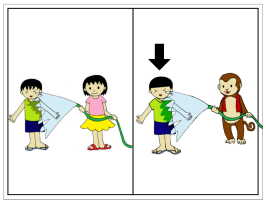
5



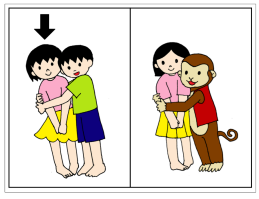
6



7



8



9

Appendix F. Resumptive Pronoun Judgement Task Items.

RC-Type	Pronoun	Grammaticality	Test Item
A	None		le tama lea ʻua kikiina le teine
A	None		le tama lea na tāofiina le teine
A	None		le manukī lea sā ʻiniina le tama
A	None		le teine lea ʻoloʻo opoina le tama
		A-RC w/o prn	**A [TAM PRN V-ina ___ O]**
A	Prn		le tama lea sā ia tosoina le teine
A	Prn		le teine lea ʻua ia siʻiina le manukī
A	Prn		le manukī lea ʻoloʻo ia tuliina le teine
A	Prn		le teine lea na ia tūleiina le tama
		A-RC w prn	**A [TAM V-ina ___ O]**
O	None		le teine lea na ʻini e le tama
O	None		le tama lea ʻua tūlei e le teine
O	None		le manukī lea sā fusi e le tama
O	None		le teine lea ʻoloʻo toso e le tama
		O-RC w/o prn	**O [TAM V e A ___]**
O	Prn	*	le teine ʻoloʻo ia tūlei e le manukī
O	Prn	*	le tama lea sā ia siʻi e le teine
O	Prn	*	le manukī lea ʻua ia tuli e le tama
O	Prn	*	le tama lea na ia toso e le maile
		O-RC w prn	*** O [TAM PRN V e A ___]**
S	None		le teine lea ʻua tū i luga o le nofoa
S	None		le tama lea na tamoʻe i luma o le fale
S	None		le tama lea sā taʻalo i fafo
S	None		le teine lea ʻoloʻo siva i luga o le laulau
		S-RC w/o prn	**O [TAM V]**
S	Prn	*	le teine lea ʻua ia tāʻele
S	Prn	*	le tama lea sā ia nofo i luga o le taʻavale
S	Prn	*	le tama lea ʻoloʻo ia tagi i luma o le fale
S	Prn	*	le teine lea na ia ʻata
		S-RC w prn	*** O [TAM PRN V]**

Sent. Type	Grammaticality	Filler Item
Decl.	*	ʻua pē le tuai taʻavale lea
Decl.	*	ʻo le telē tusi lanu moana
Decl.	*	e mūmū maile ia ʻai
Decl.	*	ʻo le tama laʻitiiti fale nofo
	Decl.	**Adj N**
Decl.		e poto tele le tama lea
Decl.		ʻua fiamoe le teineitiiti
Decl.		na alu le tama ʻi le faleʻoloa
Decl.		sā ʻataʻata le tamāloa i le mea ʻua tupu
	Decl.	**TAM V S**
Num.	*	e manaʻo le tama ʻi tolu tusi
Num.	*	na tago le tama e ono ʻapu na ʻai
Num.	*	e fiafia le teine ʻi nā lima taʻavale taʻalo
Num.	*	ʻoloʻo taumafai le tama e fā ʻapa pīsupo faʻatau
	Num.	**TAM V Num S**
Num.		sā vaʻai le teine ʻi le taʻavale e tasi
Num.		na ʻata le tama ʻi maile ia e tolu
Num.		e fia faʻatau e le tama ʻapa inu ia e tolu
Num.		ʻoloʻo matamata le manukī ʻi tama toʻafā ʻoloʻo tāʻaʻalo
	Num.	**TAM V S Num**
Cl. Prn.	*	sā ia tagi i taimi ʻuma
Cl. Prn.	*	na te alu ʻi le lotu i aso sā ʻuma
Cl. Prn.	*	ʻua ia nofo i luga o le taʻavale
Cl. Prn.	*	ʻoloʻo ia āʻoga ʻi le Iunivesitē o Hawaiʻi
	3S Cl. Prn.	**TAM 3S V S**
Cl. Prn.		ʻou te fiafia e faitau tusi
Cl. Prn.		ʻoloʻo nofo ʻo ia i lalo o le lāʻau
Cl. Prn.		na ʻou siʻi le tama i luga o le laulau
Cl. Prn.		ʻou te fiafia tele e ʻai talo ma faʻi
	1S Cl. Prn.	**TAM 1S V S**

Appendix G. Production Tasks – Individual Participant Results.

Native Results

		Tr. Decl.		**O-RC**		**A-RC**		**O-WH**		**A-WH**	
No.	Participant	Erg. Case	%	Erg. Case	%	*-Ina*	%	Erg. Case	%	*-Ina*	%
1	LF5	5	1	5	1	1	0.2	5	1	2	0.4
2	TM3	3	0.6	5	1	4	0.8	5	1	5	1
3	AF2	5	1	5	1	5	1	5	1	5	1
4	KM4	5	1	5	1	5	1	5	1	5	1
5	FF2	5	1	5	1	5	1	5	1	5	1
6	IM2	5	1	5	1	5	1	5	1	5	1
7	TM5	5	1	5	1	5	1	5	1	5	1
8	LF4	5	1	5	1	0	0	5	1	5	1
9	FM2	5	1	5	1	5	1	5	1	5	1
10	TM4	5	1	5	1	0	0	5	1	5	1
11	JM3	5	1	5	1	5	1	5	1	5	1
12	PM2	5	1	5	1	2	0.4	5	1	5	1
13	TM2	5	1	5	1	5	1	5	1	5	1
14	SM2	5	1	5	1	5	1	5	1	5	1
15	JM2	5	1	5	1	5	1	5	1	5	1
16	TF2	5	1	5	1	4	0.8	5	1	5	1
17	JM1	5	1	5	1	0	0	5	1	5	1
18	FF1	5	1	5	1	5	1	5	1	5	1
19	MM1	5	1	5	1	5	1	5	1	5	1
20	SM1	5	1	5	1	5	1	5	1	5	1
21	NF1	5	1	5	1	0	0	5	1	5	1
22	JM21	5	1	5	1	5	1	5	1	5	1
23	AM1	5	1	5	1	5	1	5	1	5	1
24	JM22	5	1	5	1	0	0	5	1	5	1
25	UM2	5	1	5	1	5	1	5	1	1	0.2
26	VM2	5	1	5	1	5	1	5	1	5	1
27	FF1	5	1	5	1	0	0	5	1	5	1
28	TF21	5	1	5	1	5	1	5	1	5	1
29	JF3	5	1	5	1	5	1	5	1	5	1
30	KM3	5	1	5	1	5	1	5	1	5	1
31	ME2	5	1	5	1	5	1	5	1	5	1
32	IU2	5	1	5	1	5	1	5	1	5	1
33	LG2	5	1	5	1	5	1	5	1	5	1
34	JT2	5	1	5	1	5	1	5	1	5	1
35	RA5	5	1	5	1	3	0.6	5	1	5	1
36	MP2	5	1	5	1	5	1	5	1	5	1
37	FF2	5	1	5	1	5	1	5	1	5	1
38	NIF2	5	1	5	1	5	1	5	1	5	1
39	JIM2	5	1	5	1	5	1	5	1	5	1
40	FM5	5	1	5	1	5	1	5	1	5	1
	TOTAL	**%**	**.99**		**1**		**0.79**		**1**		**.96**

Heritage Results

		DECLS			WhQs						RCs			
CONTROL		Erg. Case			O-Wh (Erg.)			A-Wh (-ina)			O-RC (Erg.)		A-RC (-ina)	
	Prtcpnt	Prtst	Imd	Dly	Prtst	Imd	Dly	Prtst	Imd	Dly	Prtst	Ext	Prtst	Ext
1	H.KMF	0	0	0	0	0	0	0	0	0	0	0	0	0
2	H.TLM	0	0	0	0	0	0	0	0	0	0	0	0	0
3	H.MFF	0	0	0	0	0	0	0	0	0	0	0	0	0
4	H.MLF	0	0	0	0	0	0	0	0	0	0	0	0	0
5	H.JFF	0	0	0	0	0	0	0	0	0	0	0	0	0
6	H.FMM	0	0	0	0	0	0	1	2	1	0	0	0	0
7	H.LVF	0	0	0	0	0	0	2	1	2	0	0	0	0
8	H.JLM	0	0	0	0	0	0	0	0	0	0	0	0	0
9	H.SIM	0	0	0	0	0	0	0	0	0	0	0	0	0
10	H.SMM	0	0	0	0	0	0	0	0	0	0	0	0	0
11	H.SPF	0	0	0	0	0	0	0	0	0	0	0	0	0
12	H.PFM	0	0	0	0	0	0	0	0	0	0	0	0	0
13	H.TPF	0	0	0	0	0	0	0	0	0	0	0	0	0
14	H.SPF	0	0	0	0	0	0	0	0	0	0	0	0	0
15	H.ATF	0	0	0	0	0	0	0	0	0	0	0	0	0
	Erg.%	0	0	0	0	0	0	0.04	0.04	0.04	0	0	0	0

		DECLS			WhQs						RCs			
MORPH.		Erg. Case			O-Wh (Erg.)			A-Wh (-ina)			O-RC (Erg.)		A-RC (-ina)	
	Prtcpnt	Prtest	Imd	Dly	Prtst	Imd	Dly	Prtst	Imd	Dly	Prtst	Dly	Prtst	Dly
1	H.LMM	0	3	5	0	0	0	0	0	0	0	0	0	0
2	H.FLF	0	5	5	0	1	5	0	0	0	0	5	0	0
3	H.TMM	0	2	0	0	1	0	0	0	0	0	0	0	0
4	H.VMF	0	5	5	0	5	2	3	3	3	0	5	0	0
5	H.AUF	0	4	2	0	1	1	2	2	1	0	0	0	0
6	H.SSM	0	5	4	0	5	4	0	0	0	0	2	0	0
7	H.SUF	0	5	3	0	1	0	0	0	0	0	0	0	0
8	H.AEF	0	5	3	0	0	0	0	0	0	0	0	0	0
9	H.JMF	0	5	5	0	0	0	0	0	0	0	0	0	0
10	H.PSM	0	1	2	0	0	0	0	0	0	0	1	0	0
11	H.ACF	0	5	5	0	0	0	0	0	0	0	0	0	0
12	H.MSM	0	5	2	0	0	0	0	0	0	0	0	0	0
13	H.NIF	0	5	4	0	2	2	0	0	0	0	1	0	0
14	H.DMF	0	3	3	0	0	1	0	0	0	0	0	0	0
15	H.MMM	0	5	5	0	0	0	0	0	0	0	0	0	0
	Erg.%	0.00	0.84	0.71	0.00	0.21	0.20	0.07	0.07	0.05	0.00	0.19	0.00	0.00

		DECLS			WhQs						RCs			

SYNT.		Erg. Case			O-Wh (Erg.)			A-Wh (-ina)			O-RC (Erg.)		A-RC (-ina)	
	Prtcpnt	Prtst	Imd	Dly	Prtst	Imd	Dely	Prtst	Imd	Dly	Prtst	Dly	Prtst	Dly
1	H.ELM	0	4	0	0	5	2	0	5	4	0	3	0	2
2	H.ALF	0	3	2	0	5	3	0	4	4	0	3	0	3
3	H.LFM	0	5	0	0	5	1	0	5	1	0	0	0	1
4	H.GFM	0	1	0	0	3	3	0	4	3	0	2	0	3
5	H.SUM	0	3	2	0	5	2	0	5	4	0	3	0	2
6	H.JMF	0	5	5	0	5	5	0	5	5	0	5	0	5
7	H.SWF	0	0	0	0	3	2	0	3	3	0	0	0	0
8	H.BSF	0	0	1	0	5	5	0	5	5	0	5	0	5
9	H.VWM	0	1	2	0	5	5	0	5	5	0	4	0	5
10	H.LFF	0	5	5	0	5	5	1	4	5	0	5	0	5
11	H.KFF	0	1	3	0	4	3	0	5	2	0	0	0	0
12	H.JNM	0	3	0	0	5	2	0	5	4	0	3	0	2
13	H.FMF	0	3	2	0	3	3	0	5	4	0	3	0	3
14	H.DMM	0	0	0	0	3	2	0	3	4	0	2	0	2
15	H.TTM	0	5	3	0	5	3	0	5	3	0	4	0	1
	Erg.Case%	0.00	0.52	0.33	0.00	0.88	0.61	0.01	0.91	0.75	0.00	0.56	0.00	0.52

L2 Results

		DECLS			WhQs						RCs			
CONTROL		Erg. Case			O-Wh (Erg.)			A-Wh (-ina)			O-RC (Erg.)		A-RC (-ina)	
	Prtcpnt	Prtst	Imd	Dly	Prtst	Imd	Dly	Prtst	Imd	Dly	Prtst	Dly	Prtst	Dly
1	SL.MEM	0	0	0	0	0	0	0	0	0	0	0	0	0
2	SL.CHF	0	0	0	0	0	0	0	0	0	0	0	0	0
3	SL.BSF	0	0	0	0	0	0	0	0	0	0	0	0	0
4	SL.KMF	0	0	0	0	0	0	0	0	0	0	0	0	0
5	SL..JLM	0	0	0	0	0	0	0	0	0	0	0	0	0
6	SL.RTM	0	0	0	0	0	0	0	0	0	0	0	0	0
7	SL.DVM	0	0	0	0	0	0	0	0	0	0	0	0	0
8	SL.DTF	0	0	0	0	0	0	0	0	0	0	0	0	0
9	SL.BSM	0	0	0	0	0	0	0	0	0	0	0	0	0
10	SL.DNM	0	0	0	0	0	0	0	0	0	0	0	0	0
	Erg%	0	0	0	0	0	0	0	0	0	0	0	0	0

		DECLS			WhQs						RCs			
MORPH.		**Erg. Case**			**O-Wh (Erg.)**			**A-Wh (-ina)**			**O-RC (Erg.)**		**A-RC (-ina)**	
	Participant	**Prtst**	**Imd**	**Dly**	**Prtst**	**Imd**	**Dly**	**Prtst**	**Imd**	**Dly**	**Prtst**	**Dly**	**Prtst**	**Dly**
1	SL.KPM	0	5	1	0	2	0	0	0	0	0	0	0	0
2	SL.JRM	0	4	2	0	0	0	0	0	0	0	0	0	0
3	SL.RFM	0	5	0	0	2	0	0	0	0	0	0	0	0
4	SL.JGF	0	3	3	0	2	1	0	0	0	0	0	0	0
5	SL.JHM	0	4	2	0	0	0	0	0	0	0	0	0	0
6	SL.KRM	0	3	0	0	0	0	0	0	0	0	0	0	0
7	SL.LJF	0	2	2	0	0	0	0	0	0	0	0	0	0
8	SL.MRM	0	2	2	0	0	0	0	0	0	0	0	0	0
9	SL.BHM	0	4	2	0	2	1	0	0	0	0	0	0	0
10	SL.JMM	0	4	0	0	0	0	0	0	0	0	0	0	0
	Erg.Case%	0	0.72	0.28	0	0.16	0.04	0	0	0	0	0	0	0

		DECLS			WhQs						RCs			
SYNT.		**Erg. Case**			**O-Wh (Erg.)**			**A-Wh (-ina)**			**O-RC (Erg.)**		**A-RC (-ina)**	
	Participant	**Prtst**	**Imd**	**Dly**	**Prtst**	**Imd**	**Dly**	**Prtst**	**Imd**	**Dly**	**Prtst**	**Dly**	**Prtst**	**Dly**
1	S.SL.BSM	0	1	0	0	4	0	0	3	0	0	0	0	0
2	S.SL.CSM	0	2	2	0	2	1	0	5	2	0	0	0	0
3	S.SL.HFF	0	5	3	0	2	0	0	2	0	0	0	0	0
4	S.SL.GNM	0	2	2	0	2	0	0	5	0	0	0	0	0
5	S.SL.TSF	0	0	0	0	2	2	0	5	1	0	0	0	0
6	S.SL.SHM	0	1	1	0	4	0	0	3	2	0	0	0	0
7	S.SL.GHM	0	5	2	0	2	0	0	2	0	0	0	0	0
8	S.SL.DUM	0	3	0	0	3	1	0	3	1	0	0	0	0
9	S.SL.DGM	0	0	0	0	3	0	0	4	2	0	0	0	0
10	S.SL.MTM	0	0	0	0	4	1	0	5	1	0	0	0	0
	Erg.Case%	0	0.38	0.20	0	0.56	0.10	0	0.74	0.18	0	0	0	0

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